



3 1761 11701931 5

RB8673



Presented to
The Library
of the
University of Toronto
by
F. M. Feehan, Esq.

HANDBOUND
AT THE



UNIVERSITY OF
TORONTO PRESS

CA1
Z 1
-59G21

Government
Publication

Copy

Canada. Royal commission on the
Great Slave Lake Railway.

Hearings. v. 17-19, 1959.

1960



Digitized by the Internet Archive
in 2023 with funding from
University of Toronto

2785

ROYAL COMMISSION

ON

GREAT SLAVE LAKE RAILWAY

HEARINGS

HELD AT

EDMONTON, ALBERTA

VOLUME No.: 17

DATE:

Oct. 15/59

OFFICIAL REPORTERS
ANGUS, STONEHOUSE & CO. LTD.

372 BAY STREET
TORONTO

EM. 4-7383

EM. 4-5865



ANGUS, STONEHOUSE & CO. LTD.
TORONTO, ONTARIO

ROYAL COMMISSION ON
THE GREAT SLAVE LAKE RAILWAY

Hearings of the Royal Commission on
the Great Slave Lake Railway held
at the Court House, Edmonton, Alberta,
at 10.00 a.m., October 15th, 1959

PRESENT:

MR. M. E. MANNING Chairman

MR. WALTER D. GAINER Member

MR. JOHN ANDERSON-THOMSON Member

MR. FRANCIS M. FEEHAN Counsel

MR. A. PATERSON Secretary



---On resuming at 10.00 a.m.

THE CHAIRMAN: Mr. Bishop, Mr. Rueger is here, and can you go on with him? I would like to ask him a few questions. Mr. Feehan may have a few questions, too.

MR. BISHOP: Yes, Mr. Chairman. We will ask Mr. Rueger to step up to the witness box.

THE CHAIRMAN: Mr. Rueger, you told me something yesterday about some of the timber cruising you have done, I think?

A. Yes.

THE CHAIRMAN: And it was done all around, in every direction, from Waterways?

MR. RUEGER: Yes, it was.

THE CHAIRMAN: You found nothing of interest south of Waterways?

MR. RUEGER: Definitely not, Mr. Chairman.

THE CHAIRMAN: You only went about seven miles west of the river, the Athabasca river?

MR. RUEGER: That is west of Waterways?

THE CHAIRMAN: Yes, west of the Athabasca river.

MR. RUEGER: Yes. It is not north of Waterways, actually. But we went down to McKay.

THE CHAIRMAN: How far is McKay?

MR. RUEGER: Approximately 35, 36 miles.

THE CHAIRMAN: That is as far as you did



your cruising?

MR. RUEGER: Yes.

THE CHAIRMAN: And you went about seven miles, did you say, west of the Athabasca river?

MR. RUEGER: No, we didn't go that far; four to five miles off the river.

THE CHAIRMAN: Off the Athabasca river?

MR. RUEGER: That is correct.

THE CHAIRMAN: How far east of the Athabasca river did you go?

MR. RUEGER: Maybe two to three miles. We covered the river more or less. We are interested along the river valley, and that is where the poplar is found mostly.

THE CHAIRMAN: It is mostly right in the river valley, is it?

MR. RUEGER: Yes, that is correct; along creeks on the river bottom, river flats.

THE CHAIRMAN: Did you find much poplar in that area?

MR. RUEGER: Yes, there is quite a bit of poplar there, a good quality of poplar.

THE CHAIRMAN: Can you give us an estimate of how much is there?

MR. RUEGER: It is hard to say, but what we are interested in there would be enough for our operation for five to six, seven years.

THE CHAIRMAN: And then what poplar would



be taken out and how long would you have to wait before you might hope for another crop?

MR. RUEGER: We would have to go further on, probably. We didn't spend any time to go further down the river, but there is supposed to be more all the way down the river, according to the Forestry Department, down the lake.

THE CHAIRMAN: In the strip 35 miles north you found enough poplar for your operations for about five years.

MR. RUEGER: That is correct, Mr. Chairman.

THE CHAIRMAN: How much do you use each year?

MR. RUEGER: We are using at present approximately 6 million feet per year.

THE CHAIRMAN: About 30 million feet there?

MR. RUEGER: Yes, more or less.

THE CHAIRMAN: Now, if a railroad were built along the west side of the Athabasca river, it would be very close to all the poplar which you looked at there, wouldn't it?

MR. RUEGER: That is correct.

THE CHAIRMAN: You would take that out, I suppose, during the summer months?

MR. RUEGER: It is winter and summer months.

THE CHAIRMAN: You take that out winter and summer?

MR. RUEGER: Yes.

THE CHAIRMAN: What would you do about the



poplar on the east side of the Athabasca river?

MR. RUEGER: I would assume that has to be hauled across the ice in the winter time.

THE CHAIRMAN: And then taken in by rail?

MR. RUEGER: By rail, that is right.

THE CHAIRMAN: How far do you feel you can truck your poplar?

MR. RUEGER: To start any logging operation, I should say it shouldn't be further than five miles, and then after a few years we would be faced with a haul up to twenty miles, anyway. But to start out we feel it shouldn't be very much above five miles.

THE CHAIRMAN: But you feel it is practical, didn't you tell us yesterday, up to 20 miles?

MR. RUEGER: Yes, up to 20 miles; that is correct.

THE CHAIRMAN: Mr. Rueger, it would be a convenience to you to have a railroad, wouldn't it?

MR. RUEGER: Definitely, Mr. Chairman.

THE CHAIRMAN: But it is practical to truck most of it that is there now?

MR. RUEGER: I don't think so, Mr. Chairman. We are faced with that problem right now, Mr. Chairman, to haul 20 miles and about 5 miles in our present areas, so we don't feel we want to go into a new area and start out with 20 miles again.

THE CHAIRMAN: You could have a mill just across the Clearwater river to start with?



MR. RUEGER: Right at Waterways?

THE CHAIRMAN: Yes.

MR. RUEGER: That timber right at Waterways isn't too good a quality and there isn't a big amount there.

THE CHAIRMAN: How far would you have to go to get good quality timber?

MR. RUEGER: By truck at the present time I feel we have to go close to the Tar Island.

THE CHAIRMAN: How far is that away?

MR. RUEGER: Approximately 20 miles, 22 miles to Tar Island.

MR. GRIMBLE: Tar Island is near Mildred Lake, upstream from Mildred Lake.

THE CHAIRMAN: What you are speaking of is timber that exists between 20 miles north of Waterways and 35 miles north?

MR. RUEGER: That is correct.

THE CHAIRMAN: So there is a stretch of 15 miles in ~~there~~ that you have looked at and you like the looks of?

MR. RUEGER: Yes, which is good quality and a fair amount.

THE CHAIRMAN: It is not feasible at the moment to truck it?

MR. RUEGER: No.

THE CHAIRMAN: You say most of this lumber that you have been referring to is between 20 miles



and 35 miles north of Waterways?

MR. RUEGER: Yes.

THE CHAIRMAN: And it is on both sides of the Athabasca river?

MR. RUEGER: That is correct.

THE CHAIRMAN: Is it all evenly divided?

MR. RUEGER: I would say it is more on the west side of the Athabasca than on the east.

THE CHAIRMAN: Much more on the west side?

MR. RUEGER: Yes, I feel so.

THE CHAIRMAN: How much more?

MR. RUEGER: Oh, maybe 30 per cent to 40 per cent more, probably.

THE CHAIRMAN: Those are all the questions I have, Mr. Rueger. Mr. Gainer may have some questions.

COMMISSIONER GAINER: Mr. Rueger, you have mentioned that, on the basis of your present cruising operation you would think already that there was five to six years of suitable timber for your operation?

MR. RUEGER: Yes.

COMMISSIONER GAINER: Have you not looked beyond that? What would likely be the nature of your operation? Would you get a limit, say, for five or six years, and if you decided to go into the area, then you would begin looking downstream? Is there likely to be timber of the type you are interested in going north of you as your operation begins to eat into the present stands?



MR. RUEGER: If you are referring to what we would do after we exhaust our five years ---

COMMISSIONER GAINER: Yes.

MR. RUEGER: By that time we have to go on further north and probably we have to go in further to the creeks and streams common to the Athabasca.

COMMISSIONER GAINER: That would be one possibility, or the other, of course, would be to, say, examine some other areas completely. Have you reason to think there is poplar north of the five and six years or these stands you are referring to twenty to thirty-five miles north of Waterways?

MR. RUEGER: I can only tell what I hear myself from people we talk to up there, that there is a lot more timber down the river, north of McKay. But I haven't been there, except our cruiser, who knows that country fairly well; I think he has travelled twenty years in that country. So, according to him, there should be more timber north of McKay.

COMMISSIONER GAINER: Would you be likely to establish a logging operation on the basis of this five or six years of known timber ahead of you?

MR. RUEGER: Oh, definitely; we have to. All the timber in the Great Slave area will be exhausted, I would say, in another two or three years, the way it is cut out there at the present time.

COMMISSIONER GAINER: You are only interested in black poplar?



MR. RUEGER: Yes, black and white poplar.

COMMISSIONER GAINER: You use both, do you?

MR. RUEGER: We use both, and also a small amount of spruce for cross-bending in our product.

COMMISSIONER GAINER: Just speaking fairly generally now, have you much knowledge of the comparative costs of hauling logs as compared to lumber by truck and/or by rail?

MR. RUEGER: No, I don't have any comparison there, the rate difference between poplar and spruce or other species.

COMMISSIONER GAINER: I meant between logs and sawn lumber.

MR. RUEGER: No, I couldn't give you any figures there.

THE CHAIRMAN: Any questions?

MR. FEEHAN: No further questions, sir.

THE CHAIRMAN: Thank you very much, Mr. Rueger.

MR. BISHOP: Mr. Chairman, I think possibly Mr. Denney could throw some light on the questions just raised by Mr. Gainer on the difference in cost between logs and sawn lumber.

MR. DENNEY: Mr. Chairman, it roughly costs double to haul logs than it does to haul lumber, and you arrive at that strictly on weight limits. the truck that hauls, say, 4,000 or 5,000 feet of logs will haul 8,000 or 9,000 feet of lumber. So it is



just about double to haul logs as it is to haul lumber.

COMMISSIONER GAINER: This would be in bush conditions. If it comes to a rail haul it all depends on the rates?

MR. DENNEY: Yes, that is a different matter. This is assuming a truck that has to haul out of the bush.

THE CHAIRMAN: Mr. Bishop, can we go on to the ---

MR. BISHOP: Well, I think Mr. Grimble still has a very few remarks to make.

Is Mr. Rueger free to go?

THE CHAIRMAN: Oh, yes.

MR. GRIMBLE: Mr. Chairman, you remember I couldn't find my extracts from the Gordon Commission Report, and they had been shuffled into the file of exhibits by mistake.

THE CHAIRMAN: Should we mark this as an exhibit?

MR. GRIMBLE: Yes, Mr. Chairman.

THE CHAIRMAN: What exhibit is it?

THE SECRETARY: 52-LL.

---EXHIBIT NO. 52-LL: Extracts from Gordon Commission Report.

THE CHAIRMAN: Do you want to read it, Mr. Grimble?

MR. GRIMBLE. Before I read it, I might point out these totals. While we were dealing with



these breakdowns I didn't read out the totals. I thought we should maybe have these in the transcript, and I will read them out.

The total for the two routes, east and west, of the annual allowable cut of saw timber -- for the western route the total we have is 73 million fbm. This, of course, would be coniferous pine and spruce. For the eastern route the total annual allowable cut ---

THE CHAIRMAN: Wasn't that a figure you gave us yesterday?

MR. GRIMBLE: Yes, I think I did read this one out, but not the other two.

On the eastern route it is 104 million fbm.

THE CHAIRMAN: We had those figures yesterday, I think.

MR. GRIMBLE: Yes, but not these two. The annual allowable cut of pulpwood in thousands of cords, both coniferous and deciduous, from the MacGregor Report -- for the west route it is 1,196 cords, and on the east route 1,035 cords. That is both coniferous and deciduous.

Now, for coniferous alone, which is the most desirable softwoods for pulp and paper, the annual allowable cut of pulpwood in thousands of cords from the MacGregor Report figures -- for the western route, 309,000 cords; for the east route, 594,000 cords. Approximately twice the amount is on the east route as on the west route.



I thought we should have those figures in front of us in the light of what I am to read from the Gordon Commission Report, in that our thinking towards the demand for pulpwood is not slanted because we have twice as much pulpwood on the eastern route as we have on the western route.

This is Chapter 10 on Forestry from the Gordon Commission Report. This chapter deals with the outlook for forest products under two main headings, Lumber and Pulp and Paper:

"While the outlook for forest products is in the opinion of the Commission much brighter than for wheat, it most certainly does not improve with their outlook for the mining industry.

"The report points out that the lumber industry is divided into two classes, the first consisting of a great many small mills and the second the large integrated operations which are concentrated in British Columbia."

The Commission points out:

"Transportation costs are of critical importance in determining the location of lumber mills and the market areas which they serve. The costs of transporting trees as such or as large logs, are high, unless a water network can be used to float logs to a mill, as in British Columbia -- on the West Coast the huge logs can be transported chiefly by water



and the industry there has evolved toward large mills located on tidewater on the south mainland coast or on Vancouver island, closer to the domestic and export markets they serve. These large mills also make integration feasible: there is a sufficient quantity of mill waste to justify by-product operations or the sale -- and sometimes export -- of what would otherwise be waste material, and this fuller use or sale of the raw logs itself helps support the large scale operation."

The Commission, however, expects that the typical mill will probably remain small and therefore in these mills there is little chance of production economies being effected. On the other hand, they say "These prospects regarding cost do not apply to the same extent to lumber operations on the West Coast. There the larger scale of operation provides more scope for mechanization designed to raise productivity; this along with the use of waste from lumbering in the manufacture of other products can offset, at least partly, the rising trend of lumbering costs. These mills -- and the larger eastern ones as well -- should expand production relative to the industry as a whole.

The Commission reaches the following conclusion:

"In summary, we conclude that lumber prices



will rise relatively in the future, or what is the same thing, that supply will respond to expanding demand at rising cost, thus inhibiting the expansion of the quantity demanded.

"As a result the Commission sees an increase in output by 1980 of about 60 per cent.

"With respect to the pulp and paper portion of the Forest Industry, the Commission points out that pulp and paper is heavily committed to export markets. The following quotation is interesting:

"During our hearings, we inquired into the competitive position in world markets for Canadian production of fine and coarse papers and paper board, because such products appear to be well adapted to Canada's resources, but Canadian exports of such commodities are restricted by foreign tariffs. Because of this, the Canadian producers of fine and coarse papers and paper board claimed they need tariff protection in return. This is not a matter of comparative efficiency. The domestic market is too small to yield the economies which come with specialization, while competing American mills supplying the large -- and protected -- United States market are in a position to specialize. We were informed that Canadian mills could probably hold their own in competition



if they enjoyed free and equal access to the North American market and were assured that such an arrangement would be permanent, but free access to the United States market does not seem to be a likely prospect."

The Commission points out that American consumers are obtaining an increasing percentage of their newsprint supply from home mills. They go into the reasons:

"We are told that there are several reasons for this. A technological advance is one: it is only quite recently that newsprint of satisfactory quality could be made from Southern Pine. The first mill in the southern United States began operations in 1940, but some 700,000 tons of annual capacity have been added there since the war."



Still more recently a new mill began operations in the Northeastern United States using a new process to produce newsprint from hardwoods. Assistance in the form of special depreciation provisions figured in most of these increases. Another factor has been the industrial growth in the south, which opened up new plant locations and which, through population growth, has brought the burgeoning regional market for local production."

The Commission goes on to say:

"Many of the observations and comments on newsprint are applicable to pulp exports. Production of both in Canada is typically large scale and efficient; both are heavily dependent on the export trade and move in a free trade environment."

In a table showing pulp and paper output trends by main grades with annual averages for 1926 to 1930 and 1950 to 1954 projected to 1980 the Commission shows an increase for all grades of newsprint, paper, and pulp of 131%.

The accuracy of the Commission's predictions is we think very well shown in the September 19th issue of the Financial Post in their special section on the forest industries. In this section they express the concern of the industry over the development of mills in the Southern United States and rightly so. The following are listed:



Bowaters Southern	Tennessee	\$21,000,000
Coosa River Newsprint Co.	Alabama	35,000,000
International Paper Co.	Arkansas	60,000,000
Southland Paper Mills	Texas	no value of plant mentioned.

The Commission does not mention the possible effect of Alaska production on Canadian producers. In a paper recently presented to the Pacific Northwest Trade Association, B. Frank Heintzelman, past Governor of Alaska pointed to the size of the Alaska forest resources. He said "This coastal forest of between 4,000,000 and 5,000,000 acres and carrying 100,000,000,000 board feet of timber classed as presently accessible, is a proven natural resource."

He goes on to say that a start has been made on a study of the interior forest and inventory work shown: "The area that now has or originally had a substantial forest cover may be as much as 100,000,000 acres." The coastal forest is being used by the Ketchikan Pulp Mill now in operation and the Sitka mill going into production this month. These mills costing \$50,000,000 and \$60,000,000 respectively are both located at tide water. American Viscose at Puget Sound is purchasing the production of the Ketchikan Mill, and the Alaska Pulp Company, a Japanese Company, is purchasing the production of the Sitka Mill.

These developments in the Southern United States and Alaska indicate the competition for this industry, and it is interesting to note that in the



above mentioned edition of the Financial Post that no companies have been able to finance additional plants in Manitoba, Saskatchewan, or Alberta, although four plants have been built or are building as follows:

Colgar at Castlegar, B.C.	50 million
Nova Scotia Pulp Ltd. at Cape Breton, N.S.	40 million
Rayonier of Canada Ltd. in British Columbia	15 million
Irving Pulp & Paper Ltd. in New Brunswick	16 million

It is also interesting to note that Crown Zellerback decided against a mill in Newfoundland which would of course be based on overseas market.

The Commission sums up the situation very well in the last sentence in this section of their report:

"The performance of the forest industries, as we have already stressed, will be largely determined by their competitive efficiency."

MR. BISHOP: Mr. Chairman, Mr. Grimble has handed me a number of pages from Pulp and Paper, 1959 review number. We do not propose to read this into the record, but they are available for the Commission's perusal.

THE CHAIRMAN: Would you tell us what the significance of them is?

MR. BISHOP: They bear out some of the remarks Mr. Grimble has just made, particularly in connection with the development of pulp mills based on southern pine and northeastern United States hardwoods and developments overseas.



THE CHAIRMAN: It just establishes that what has been written in exhibit 52 (11) is correct.

MR. BISHOP: That is right.

MR. GRIMBLE: It is more recent than the Gordon Commission Report, this is only about a month old.

COMMISSIONER GAINER: Mr. Bishop or perhaps Mr. Grimble, would you care to summarize briefly what you feel to be the relevance of these statements on the issues here?

MR. BISHOP: I would prefer that Mr. Grimble do that.

MR. GRIMBLE: I think very briefly what it amounts to is, even though the timber is there and as we see there is twice as much coniferous on the eastern route as on the western route, this does not automatically preclude that there will be a pulp mill there. It does not mean that this timber will be developed as a pulp mill.

COMMISSIONER GAINER: Does not preclude?

MR. GRIMBLE: It does not automatically mean because the timber is there that there will be a pulp mill within 20 years. There are other factors such as world export markets, tariff barriers, efficiency of operation, distances of transportation.

COMMISSIONER GAINER: You are suggesting then that the natural pulpwood resource is perhaps not quite so critical on either route as it might



appear to be?

MR. GRIMBLE: I think there are a great many factors regarding the production of pulp that you have to take into consideration other than the fact that the timber is there.

MR. BISHOP: I think, Mr. Chairman, again we have to defer it to British Columbia in this. Referring to the remarks that Mr. Shakespeare made when he was presenting his brief in the Peace River Power Development, I do not have the reference here, but I believe at that time he referred to the fact that when the first dam is built it will be necessary to clear a very large portion of the Rocky Mountain trench of the presently standing timber, otherwise it will be lost. Possibly Mr. Southworth can enlarge on this but my recollection is it would create a necessity for at least two pulp mills within the trench area and a further three or five in the tributary areas. I think Mr. Southworth probably knows considerably more about this.

MR. FOUKS: We have no fear, if we require the pulp mills we will put it in. These figures I have just been handed, I think it may be of interest to the Commission, and I would suggest they may be put in as an exhibit. It all depends on how you interpret the figures. Just on the front page they have "All Nations producing pulp and how they rank from 1956 to 1959." The United States trend was exactly the same as it was in Canada where we ranked



second. They went from 22,100,000 to 21,700,000 and Canada went from 10,500,000 to 9,800,000. In other words, Canada is holding its position in spite of the declining market. Then, there is a comment later on again - I have to apologise because I have not had an opportunity of properly analyzing it, but on page 56 it says:

"In North America, the tidal-wave-like expansion is over. But continuing in balance and continuing cost price pressure are the present prospects. A favourable balance between capacity and consumption is not expected before 1961."

I would suggest if this railway does go in either way it won't be in 1961. I suggest these figures might be of interest in interpretation.

MR. BISHOP: We are very pleased to enter it as an exhibit, my Lord.

THE CHAIRMAN: Exhibit number 52 (mm).

--- EXHIBIT NO.52 (mm): Copy of Pulp and Paper
"World summary statistics".

MR. BISHOP: If there are no questions my Lord I will proceed with the section on mining on page 40 of the brief.

THE CHAIRMAN: Very well, there do not seem to be any further questions.

MR. BISHOP: It would be a mistake to consider that the construction of a railway to Great



Slave Lake, by either an Eastern or Western Route, would seriously curtail the movement of goods by truck transport up the Mackenzie Highway. Truck transportation has taken over a large part of the function of the railway over the last ten years, and it is now apparent that the projected railways' chief value will be to the mining industry. Where the mining industry is not involved, good highways can better serve transportation requirements.

The proposed Western Route from Grimshaw north being in the Great Plains, offers no mineral potential until the very end of the railway at Pine Point. The over-burden throughout the route makes the exploration or development of mineral resources impractical. The deposit of iron ore in the Clear Hills, 25 miles northwest of the existing N.A.R. railway terminus at Hines Creek could, if necessary, be served by an extension of the N.A.R. from Hines Creek.

There is oil and gas potential in B.C., but not in proximity to the extent that any railway would serve it. It would undoubtedly be developed and produced by highway and pipeline.

The Eastern Route from Waterways north, would tap the Athabasca Tar Sands which extend for 80 miles from McMurray north, along the Athabasca River. A semi-commercial plant is now under construction and would be served by the Eastern Route for both northbound and southbound movements.



The refined oil products from the plant would be transported by pipeline south; however, fuel oil and asphalt for Lake Athabasca and the north could move north by rail.

Sulphur from such a plant could move north by rail in the winter or by barge during high water in the spring. Silica-sand and other by-products could move south by rail.

The proposed Eastern Railway location crosses over the Peace River at Peace Point near the gypsum cliffs. This is high grade gypsum, easily mined, with a ready market in Alberta. Since the deposits are in a National Park, they have not been developed to date. However, there is the possibility of the southern boundary of the Park being moved north to place the gypsum deposits within Alberta.

Another alternative, of course, would be to change the status of the Wood Buffalo Park from a National Park to a Game Reserve, to allow exploration and development of this mineral resource. This type of mining activity would not interfere with the buffalo since the area of plains is more than adequate for the 15,000 buffalo now kept there. In this connection, it is interesting to observe that the logging of the mature and over mature timber would open up the land for better growth and grazing conditions.



The Eastern Route would make more accessible for summertime water transport and winter road connections the rich mineral area of the northeast corner of Alberta which is in the Canadian Shield and also the mining territory located in northern Saskatchewan and the Northwest Territories north of Lake Athabasca. Deposits of uranium, copper, lead and zinc have been found; but because of lack of adequate rail transportation, the area has not been prospected to any degree.

Findings to date, in the fan-shaped section of the Canadian Shield between the northeastern arm of the Great Slave and Lake Athabasca, offer similar tremendous promise. These coupled with the findings along the north shore of the northeastern arm of Great Slave Lake, give every indication that the development of the mineral resources of this area only await rail transportation. Fort Smith and Peace Point on a railway along the eastern route would be the logical railheads for these operations. The findings to date indicate sources of nickel, gold, copper, lead, zinc, and gypsum besides silver, cobalt, arsenic, bismuth, tin, tungsten, barite, fluoride, along with many others

Proceeding northward along the eastern route to its terminus at Pine Point there are huge lead-zinc deposits reported to contain over 60 million tons of ore adequate for 30 years of operation



at 200,000 tons of concentrate per year. Because of the restriction to development in the National Park, no exploration work has been carried out, but the possibility of another replacement deposit such as this occurring between Peace Point and Pine Point in the Paleozoic region along the edge of the Pre-Cambrian Shield is great. This is along the rail route.

The potential rail traffic from this huge high grade lead-zinc deposit, along with other mining traffic to Lake Athabasca in the Pre-Cambrian Shield region, makes the construction of a railway through the area north of Waterways essential. All other rail traffic moving to and from the north would be only incidental to that serving the mining industry.

The development of the north country will best be encouraged by the railway route which will offer the lowest possible freight rates for the mining produce of the north. The eastern route offers the shortest haul distance from the mining sites at Pine Point and Uranium City to Edmonton and Calgary.

I would ask Mr. Grimble to enlarge on some of these points now, Mr. Chairman.

MR. GRIMBLE: There are a few points, Mr. Chairman. One point was with regard to the Wood Buffalo Park, and I thought I might read from Thorp's thesis again with regard to the history of



Wood Buffalo Park. He states:

"The park is unique among the parks of Canada in that it was not established for its aesthetic and recreational value, but as a game reserve, chiefly for the protection of the wood bison."

THE CHAIRMAN: What page is that on, Mr. Grimble?

MR. GRIMBLE: Page 3.

I think I might read two or three excerpts regarding the mining potential and its relation to the north, if I may. These are extracts from a symposium held in Edmonton in 1958 by the Royal Society of Canada. This is a paragraph from an article by Robert F. Leggett, in Ottawa. It appears on page 21:

"It will therefore require strong economic incentives to produce any major increase in population in the northwest. And this can arise only from mineral developments. Since public expenditure per capita already far exceeds that for anywhere else in Canada and mineral development is usually a strictly economic proposition. If the Northwest can produce minerals that can compete in the markets of the world, with minerals produced elsewhere, after allowing all transportation cost, the Northwest may advance rapidly. If not, then advance must be slower."



MR. FOUKS: Before he goes any further -- does he indicate what he means by Northwest? Did he mean Alberta, British Columbia or the Northwest Territories?

MR. GRIMBLE: The District of Mackenzie and Yukon.

THE CHAIRMAN: Mr. Grimble, will you file these as exhibits?

MR. GRIMBLE: Yes.

THE CHAIRMAN: Do they indicate on them who made these statements and the reasons for making them?

MR. GRIMBLE: The author is stated.

THE CHAIRMAN: These are excerpts of statements made ---

MR. GRIMBLE: These are papers given to the Royal Society of Canada, a symposium held in Edmonton last year, and there is a book published containing these papers.

---EXHIBIT NO. 52-NN: Extract from The Canadian Northwest. Extract from Assessment by William C. Wonders.

COMMISSIONER THOMSON: Pardon my ignorance, Mr. Grimble, but who is Robert F. Leggett?

MR. GRIMBLE: He is head of the National Research Council -- at least he is head of one branch of the National Research Council in Ottawa.

I think this next one by William C. Wonders



also appears in the Railway brief. It is, yes; on page 12 of the Railway brief.

"It is now generally appreciated, I believe, that the mineral resources are the basis upon which the potential of the Northwest must primarily be assessed. Other resources may supplement its economic development but minerals will be the key, as indeed they have been for the past 50 years . . . Transportation will be governed chiefly by the mines, as at present. It may well be that the railway extension to Great Slave Lake and the introduction of new techniques of transportation designed for the particular needs of the area will see the development of new centres to provide those services, or they may simply emphasize further the importance of some of those now existing ..."

There was one further paragraph. This is from the recently published Alberta Fact Book, Alberta Industries and Resources, published by the Alberta Bureau of Statistics. It reads as follows:

"Economic Development in the Canadian North.

"The key to the development of the Mackenzie District is the mining industry. This is the only export industry of any great potential size. Any argument that it is economically important to develop the Canadian North must hang on the belief that the world's demand for minerals is



increasing more rapidly than the ability to supply at current costs from present resources.

"The Northland is a treasure house of minerals and raw materials. Virtually every known metal can be found but to date relatively little prospecting and drilling has been carried out. So far only high value metals have been exploited. There are large reserves of base metals (zinc, lead and copper) in the area. Most of the known reserves are in the Great Slave Lake area. The expected development in the mining industry centres around these base metals. This has very definite implications for transportation since base metal ore is heavy and bulky, and consequently of low value per unit weight or volume."

COMMISSIONER THOMSON: Mr. Grimble, could I have a look at that one, please?

THE CHAIRMAN: These three extracts will be marked, will they, as one exhibit?

MR. BISHOP: They will comprise Exhibit 52-NN.

COMMISSIONER THOMSON: Would it be too much to ask you, Mr. Grimble, to tell us where these reserves of base metals are?

MR. GRIMBLE: I just extracted that right from the recent publication.

COMMISSIONER THOMSON: He makes the statement



that there are large reserves of base metals. Does he refer specifically to Pine Point or some other place?

MR. GRIMBLE: I don't know, sir. That is a recent publication just mailed to me last week.

COMMISSIONER THOMSON: "Most of the known reserves are in the Great Slave Lake area." That would indicate that there was more than one.

MR. BISHOP: Mr. Chairman, we have two witnesses we would like the Commission to hear from. Possibly if we heard from them first some of the questions which might occur to the members of the Commission now may be answered. Would it be in order to call them first?

THE CHAIRMAN: Could we have a few minutes adjournment first? Who are the witnesses?

MR. BISHOP: Mr. Norman Edgar and Bruce Macdonald, both of whom you know, I believe.



THE CHAIRMAN: Mr. Bishop?

MR. BISHOP: I would like to call Mr.
Norman Edgar to the stand.

NORMAN EDGAR, called

MR. BISHOP: Mr. Edgar, would you give the Commission a run-down on your qualifications, training and experience in the area we are concerned with?

MR. EDGAR: Mr. Chairman, I graduated from Queens University in 1939. During my years at University I did undergraduate work in the Pre Cambrian country. I spent two years on geological survey parties with the geological service of Canada. In Ontario I worked in a couple of gold mines. Also I spent about three years in the field in northwestern Ontario in the Red Lake District, Kenora, and in the country surrounding the present Steep Rock Mine Development area. Following the war I spent three years in Yellowknife and worked throughout on a large part of the Western and Northwest Territories, the district of Mackenzie and the Yukon. I spent a season in the Flin Flon area in Northern Manitoba, again work in the Pre Cambrian, and I spent a year in Northern Saskatchewan in the uranium developments in 1949 and 1950 in the general area of Stoney Rapids, Beaver Lodge and the surrounding terrain.

Subsequent to 1950 I have been engaged in consulting work and have participated in a number of



privately financed prospecting ventures in Northern Saskatchewan and in the district of Mackenzie adjacent to Great Slave Lake and north of Lake Athabasca. I have examined a good many prospects, mineral prospects in that country. I think for the last five years I have made at least one, possibly two trips per year in to these areas.

I think that summarizes my general experience in the part of the country to date.

MR. BISHOP: Mr. Edgar, you are familiar with the proposed eastern route for the railway to Great Slave.

MR. EDGAR: Yes.

MR. BISHOP: Could you give the Commission your opinion as to the mining prospects in the area through which the railroad will pass and also the area which the railroad could be expected to serve.

MR. EDGAR: Yes. Well, Mr. Chairman, I should like to say that I have no intention of making large scale predictions on things because experience has shown us over the last 20 years or so that long range predictions in most affairs seem to fall short of actual accomplishments. That is, that the technical achievements in most engineering fields appear to surpass the boldest predictions that any responsible engineer might have made, say, 20 years ago. This business of making predictions about the occurrence or possibilities of finding mines is, of course, a



very difficult one because it is a matter of one's opinion perhaps supported to some extent by experience throughout the rest of the Pre Cambrian country.

It seems to me that one must look at the mineral potential of this region from several points of view. The first is in the past discoveries that have resulted in producing mines. I do not think it is necessary for me to enumerate all these, but those in the Yellowknife camp itself and those north of Great Slave Lake would constitute the one major mining area at present. The other, of course, is in the uranium development north of Lake Athabasca at Beaver Lodge Lake and in the surrounding district. Also I think that one must look at the mineral potential of the region from the statistical point of view, considering the experience that we have had in other Pre Cambrian areas in Canada. Also I think that we must consider the technical prospecting methods that have been developed particularly in the last ten years and consider the possibilities that they open up for the finding of new mineral deposits and eventually mines.

Also I think we must consider the new technological developments not only in ore finding but in ore treatments, which may make ore out of what had hitherto perhaps been regarded as mineral occurrences. I use the term "ore" and "mineral occurrences" in that sense. For instance, I think that the direct reduction processes that have been developed for the re-



duction of iron ores, eventually these make it possible to eliminate the enormously costly blast furnace operations and so permit the development of iron ore bodies that otherwise might not be possible.

I have prepared some statistics from several sources, the Financial Post and the Northern Miner. These deal mainly with the mineral production in most of the rest of Canada. In 1957 the total Canadian mineral production having a value of \$1,140,000,000, the Pre Cambrian accounted for 80.5 per cent of this production. British Columbia accounted for 11.5 per cent; the Appalachian in eastern Canada 6.8 per cent and the Yukon about 1.2 per cent. In 1958 the total mineral production in Canada surpassed previous levels to become the Nation's leading industry, a place usually reserved for agriculture. In 1959 I noticed recently that the Canadian metal export was the largest commodity exported or the largest production material exported from Canada in terms of dollar value.

THE CHAIRMAN: Have you some figures on this?

MR. EDGAR: They are quoted in the Northern Miner and this is the issue of August 13, 1959.

MR. FOUKS: Have you any extra copies of that?

THE CHAIRMAN: Have you extra copies?

MR. EDGAR: I just have the one copy. Perhaps I might just read this.



THE CHAIRMAN: Is this included in the material you sent to Mr. Fouks?

MR. GRIMBLE: No, I did not know Mr. Edgar was going to - I read this in the Northern Miner myself and clipped it out. There are two parts to it.

THE CHAIRMAN: May we have this marked as an exhibit?

MR. GRIMBLE: Fine. I can rearrange it on the page.

THE CHAIRMAN: That will be exhibit 52 (pp).

--- EXHIBIT NO. 52 (pp): Sheet with clipping from Northern Miner of August 13, 1959.

THE CHAIRMAN: That shows that minerals now provide more exports than anything else in Canada?

MR. EDGAR: The opening sentence says:
"Mineral products are now firmly established as Canada's leading export item.

In the first half of 1959 value of mineral exports was at record levels of \$955.5 million, including over \$77 million allowed for gold. This is substantially higher than the \$727 million exported by the forest products industry, and the \$616.3 million combined total for agriculture, animal, and textile products".

Would you like me to read the rest of this or is it perhaps unnecessary?

MR. BISHOP: This was only entered as



an answer to your last question, my Lord, so if you want more then the decision is yours.

MR. EDGAR: In 1957 over three quarters of the metallic mineral production of Canada came from five metals which are uranium, nickel, iron, gold and copper.

THE CHAIRMAN: In that order?

MR. EDGAR: Not necessarily. I am afraid I cannot speak too specifically on that. However, on examination of the sources -

THE CHAIRMAN: Would you mind repeating those?

MR. EDGAR: Uranium, nickel, iron, gold and copper.

THE CHAIRMAN: Lead or zinc are not included?

MR. EDGAR: No.

COMMISSIONER GAINER: Those are export figures?

COMMISSIONER THOMSON: That was 1957?

MR. EDGAR: 1957.

THE CHAIRMAN: That is three quarters of our mineral production is exported?

MR. EDGAR: No, this is over three quarters of the metallic mineral production in Canada came from these five metals. That is simply the production of them.

THE CHAIRMAN: That is in value, I suppose three quarters in value.



MR. EDGAR: Yes, it would have to be. An examination of the sources of these metals shows that the Pre Cambrian produced 100 per cent of Canada's uranium, almost 100 per cent of Canada's nickel, almost 100 per cent of Canada's iron, 90 per cent of the gold production and 80 per cent of the copper production. This mineral production comes from a relatively small part of the total Pre Cambrian area in Canada. The majority of it comes from the more settled and what we might expect to be the most intensively explored areas of the Shield; those areas served by railroads. It is difficult to estimate how much of the Shield has been intensively explored or could be regarded as intensively explored. However, I would estimate that the most intensively explored areas would not exceed perhaps 15 per cent of the total area, if that.

I think another point that should be considered is that only very few of Canada's major mines or mining centres were located and proven prior to rail construction. The majority of the metal mines - -

THE CHAIRMAN: Would you mind repeating that?

MR. EDGAR: I say I think only a few of Canada's major mines or mining centres were located and proven prior to railroad construction.

MR. FOUKS: I could not hear that clearly even the second time. I am sorry.

MR. EDGAR: I think only a few of Canada's



major mines or mining centres were located and proven prior to railway construction into the area.

COMMISSIONER GAINER: You mean, Mr. Edgar, a mining operation, or do you mean a proven location of ore bodies or the mining operation?

MR. EDGAR: Well, I mean the actual development of a mine or a mining district with several mines in it. There are a good many examples of this, various camps that have been developed following the construction of railways. You have the Porcupine Gold Camp, Hollinger, Kirkland Lake, Cobalt, Sudbury, the Little Long Lac area, the Mystery Lake country where the Thompson developments are taking place in Northern Manitoba. The Blind River uranium deposits, the deposits in the Bancroft area in Ontario, the iron deposits in the Marmora country of Ontario, the base metals in the Bathurst District of New Brunswick, the base metal, copper, zinc in the Manitouwadge area in Ontario. All of these have been found long after the railway lines have been put through the country.

THE CHAIRMAN: Mr. Edgar, do you say these were all found after the railway was put in or was it a case of developing them after the railway was put in.

MR. EDGAR: I think the majority of them were not only found afterwards but developed afterwards.

THE CHAIRMAN: The original prospect was



not known until after the railway went in?

MR. EDGAR: Right. I have taken some of the statistics for mineral - -

THE CHAIRMAN: Mr. Edgar, would you mind pausing for a moment? As I recall it, Dr. Hume made the remark when Mr. Jewitt was here that he was inclined to think usually the mine came first and the railroad afterwards. Mr. Jewitt said he agreed with that statement. Now, that seems to be contrary to the opinion you have just expressed, does it not?

MR. EDGAR: To some extent it does.

THE CHAIRMAN: Were you here that day? You were here about that time.

MR. EDGAR: I think I was, yes. I do not remember those remarks, but there are always exceptions to the rule. I do not think the exceptions - not the exceptions, but the areas I have mentioned in here could be regarded as real exceptions. These have been some of the most prolific and wealthiest mining camps the country has produced.

THE CHAIRMAN: And these were all mining camps where the original prospect was found after the railway had been built?

MR. EDGAR: Yes.

THE CHAIRMAN: And where the presence of the railway at least contributed to the finding of the ore body.

MR. EDGAR: Yes, that is correct.



MR. FOUKS: May I ask on this point because I have Dr. Hume's testimony here. I want to be sure I am asking the question the right way. Mr. Edgar, you say that the railroads were put in in hopes of finding some mines or had the prospecting been done first and then a railway go in?

MR. EDGAR: Well, not at all. The railways that I refer to are the only railways that would have crossed this country, the Canadian Pacific and the Canadian National.

MR. FOUKS: You are talking about Trans-continental railroads as such?

MR. EDGAR: Not entirely but, for instance, in the Sudbury area the Trans-continental railways went through there and they went through there before these major base metal deposits were discovered.

MR. FOUKS: It still does not answer my question. In other words, can you give us an example? I am not a geologist or a mineral man, but could you give us an example where a railway was put in strictly in the hope that a mine might be found.

MR. EDGAR: Oh no, I cannot do that.

MR. FOUKS: That is fine. That is the difference between the location and proven in the question you put, Mr. Chairman.

THE CHAIRMAN: It made me wonder, but I don't know that the Trans-continental railroad should be said that in the building of the Trans-



continental railroad mining was not in the minds of the people who planned it.

MR. FOUKS: I am merely suggesting that mines existed as such. I was getting the impression that they were built for the purpose of finding, locating and proving mines, and it was my impression after speaking to Dr. Hume that if there was a branch line as we are now discussing the find would come first and the railway would go through like Pine Point, for example, but not building a line for the purpose of hoping to find a mine.

THE CHAIRMAN: You have the reference to Dr. Hume's statement?

MR. FOUKS: Yes I have. This started at about page 1442 and goes to page 1445. Now, that is not the statement that you refer to as such, that remark when Dr. Jewitt was here and Dr. Hume came up front and there was a discussion close by.

THE CHAIRMAN: The one I refer to was made somewhat casually and we were looking at a map and talking of something else really.

COMMISSIONER THOMSON: Did Dr. Riley not make some reference to that?

MR. FOUKS: Yes, he did as well.

COMMISSIONER THOMSON: Yes, it seems to me he made that reference also.

MR. BISHOP: I think I should point out at this stage, Mr. Chairman, that we are not attempt-



ing to support the proposition that a railway should be built strictly for the purpose of serving mines that have not yet been found. I submit that is very similar to the railroad that has been referred to in the sense that this particular railroad is, I presume, to go to Pine Point which is a mining prospect we all agree or admit exists. The question before us is the location and the particular point for us right now is whether it is desirable to have that location near to mining possibilities. I think Dr. Hume's statement and Mr. Jewitt's statement are still quite consistent with our position.

MR. EDGAR: The last of the statistical references I would like to make and these again I must say are presented purely for the purpose of demonstrating, perhaps by analogy, that the Pre Cambrian must be regarded as the principal source of mineral deposits.



The figures for 1950 that I have compiled show that the value of mineral production from the Northwest Territories approximates \$10,150,000. I must approximate that because I have not got the accurate figures from the Consolidated Mining and Smelting Company, which they apparently do not publish.

For the same year in Saskatchewan, mainly in the uranium production, on the Beaver Lodge area, the total figure approximates \$54,590,000, giving a total of about \$64,750,000.

Now, of the total Canadian mineral production, this is about 6.1 per cent. So that I think it demonstrates the fact that in these relatively remote areas, where a development of mines has not been as rapid as it has been in the more settled and more developed areas of Canada to the south and to the east, the possibilities are certainly very large.

I thought it might be interesting again, considering the potential, to show you these maps which show the areas covered by aero-magnetic surveys by the Dominion Government. I might at this stage point out that the development of prospecting techniques for metals, particularly for base metals, large sulphide orebodies, has been developed to the point now where airborne surveys, using electro-magnetic methods, could cover very large areas in a relatively short time and pinpoint areas of



interest which could then be given very intensive ground examination. These techniques have been very successfully carried out in eastern Canada, principally, and there are very large areas in the district which we are considering adjacent to this railroad that have not been covered at all by any form of airborne surveys.

This information sheet was dated January 31st, 1959, and it is possible there may have been one or two additional sheets issued since that time which have not been plotted on here. But, in general, the region north of Lake Athabasca to the Great Slave Lake, including the areas that have been pointed out previously as being a potential, that is of greatest potential in here, have not been covered at all by these surveys.

THE CHAIRMAN: Before you go any further, could we have those two maps marked as an exhibit?

MR. EDGAR: Yes.

---EXHIBIT NO. 52-QQ: Maps.

COMMISSIONER GAINER: The aero-magnetic surveys are designed to register in regard to what types of ore?

MR. EDGAR: Well, they may -- of course, the magnetic surveys are most responsive to magnetic conditions in the ground. However, they not only show the presence of magnetic iron deposits but the structures of the rock formations in which these minerals



may occur may also, perhaps, show up through the contouring which has been done, showing the relative strength throughout the area, and these do, in some cases, lead to intensive ground work which may result in mineral discoveries.

COMMISSIONER GAINER: Is that sort of information -- are the differentials demonstrated very illuminating, other than where there is iron present?

MR. EDGAR: Well, there have been a great many interpretations; every geophysicist has his interpretation of the result. But I think it can be said that they do reflect some result. But my point in bringing this up is mainly to demonstrate that this very large area in here, which must be considered a potential one, has never been covered by these magnetic surveys, nor, to the best of my knowledge, has there been any intensive private work done by private companies, doing electro-magnetic work as well.

MR. FOUKS: I wonder if you would describe the area more specifically, because in the transcript it says "here".

MR. EDGAR: Well, I refer to the area bounded on the west by the Slave River and on the south by essentially Lake Athabasca, on the east by the 108th meridian and on the north by Great Slave Lake.

THE CHAIRMAN: Mr. Edgar, may I interrupt you for a moment to make sure I have a note of what you have been stating. These are aero-magnetic



surveys, are they?

MR. EDGAR: Yes.

THE CHAIRMAN: And they are done by the
Dominion Government?

MR. EDGAR: These particular surveys are.

THE CHAIRMAN: And the material is available
for any person to obtain?

MR. EDGAR: Yes; these maps are completed
and they are available to the public.

THE CHAIRMAN: Are there any other types of
aerial surveys being made?

MR. EDGAR: Not by the government at the pre-
sent time, to my knowledge.

THE CHAIRMAN: Just magnetic surveys?

MR. EDGAR: Yes, although I believe there has
been some consideration given to adding the magnetic
to aero-magnetic surveys as well. It is apparently
expensive.

THE CHAIRMAN: Do you know why it is that
the areas have been chosen that are marked out there?

MR. EDGAR: I should think that this area
at the western end of Great Slave Lake must have been
done to supplement the information regarding the
Pine Point deposits, and also possibly to assist the
exploration for oil and gas that might have been found
in that region. I think the same thing can be said
for this big area to the south of Lake Athabasca,
centred around McMurray, perhaps. I think again that



was mainly done with a view to assisting in the oil and gas exploration. This area east of the Great Slave Lake -- I should think that in general it would be a start of a programme for the entire country. Why that particular region was selected I am afraid I couldn't say, but no doubt in time this region to the west will be covered by the same type of surveys.

COMMISSIONER GAINER: Have they not flown a distance north quite substantially on these surveys? I thought they had, north of Bear Lake. This is the last that has been published, and all they have done in this regard?

MR. EDGAR: This is the Canadian Government surveys, aero-magnetic surveys. Well, I haven't concerned myself with Great Bear Lake.

The other district I would like to point out as well is this region south of Lake Athabasca which is shown on this large map here in this yellow colour.

THE CHAIRMAN: That is the large map you are looking at, Exhibit 52-B?

MR. EDGAR: This area outlined in yellow south of Lake Athabasca down to Cree Lake on the south and on the east here and essentially the Athabasca river on the west is generally overlain by Athabasca sandstone, obscuring the Pre-Cambrian rocks beneath it. There is very little knowledge of the actual depth and thickness of this, but it



seems that recent work has shown at least one location in Saskatchewan where it was very thin or non-existent, so there was actually a window of the Pre-Cambrian showing through it.

It seems to me that airborne magnetic and/or electro-magnetic surveys of that region which has not been surveyed as yet could possibly show deposits which have not as yet been developed. I am not saying there are any, but it is a possibility that must be considered. It is a very large area.

COMMISSIONER GAINER: You are speaking of prospects in the Pre-Cambrian underneath or in the top formation?

MR. EDGAR: Yes.

MR. FEEHAN: What type of minerals would not be shown up by these magnetic surveys?

MR. EDGAR: Oh, there are not many would not be shown up on these magnetic surveys. But the magnetic surveys in addition to locating magnetic iron deposits or other magnetic mineral deposits do indicate the possibilities of geological structures which may contain deposits which may not respond to these methods of exploration, and you may pursue ground exploration, followed by drilling or making holes of some sort in order to determine what is there.

MR. BISHOP: That is similar to seismographic work upon structures favourable to bearing



oil but doesn't show the oil.

MR. EDGAR: That is a good analogy.

MR. FOUKS: Do I understand you correctly that you are saying that the area bounded on the west by the Slave River, on the south by the Lake Athabasca, on the east by the 108th meridian and on the north by the Great Slave Lake has not been, in your opinion, surveyed by aero-magnetic surveys or prospected or properly surveyed to this date?

MR. EDGAR: No, I simply state that that large area has only had a very small part of it covered by these aero-magnetic surveys.

MR. FOUKS: You are restricting it to aero-magnetic surveys?

MR. EDGAR: Yes. There has certainly been some prospecting done there. But the point I am making is that these new airborne survey techniques have been extremely successful in other parts of the country, and there is no reason they will not be successful here.

MR. FOUKS: Which, in your opinion, would be more reliable: prospecting, drilling or magnetic surveys?

MR. EDGAR: They don't do it quite in that order. In an unknown area the technique today seems, to me, to be with the airborne surveys and then you follow that up by ground work.

MR. FOUKS: Let's assume you are correct and



unquestionably it hasn't been surveyed but it has been prospected, actually prospected on the ground, which would be more reliable from your point of view?

MR. EDGAR: Oh, the ground prospecting.

MR. FOUKS: If it was prospected, regardless of the fact that there were no aerial surveys, that would indicate that there were findings available?

MR. EDGAR: Oh, it would be if it had been fully prospected.

MR. FOUKS: Are you saying that there are large areas which have not been thoroughly prospected on the ground?

MR. EDGAR: Yes.

MR. FOUKS: Can you indicate those areas?

MR. EDGAR: Not essentially. When I say large areas I mean areas favourable to geological formations which extend on this map -- this is again the area north of Lake Athabasca north to Great Slave Lake.

MR. FEEHAN: You are referring to Exhibit 52-C?

MR. FOUKS: That has not been prospected?

MR. EDGAR: Not at all. This broad area sweeping up from here which is coloured green, yellow, indicates rock formations which are perhaps more likely to contain mineral deposits than these other areas; and there has been prospecting done there and there are large areas through this belt of rocks where there is no outcropping, and one of the successful



techniques that has been employed in the past are these airborne techniques which pinpoint the location on the ground, which can then be followed up by intensive ground work.

MR. FOUKS: If there had been intensive ground work, would it have been found, in your opinion?

MR. EDGAR: Perhaps yes. It depends.

THE CHAIRMAN: There have been many spots where mines have been found where there has been prospecting for many years before a mine has been discovered.

MR. EDGAR: Yes.

MR. FEEHAN: Is it fair to say that in areas where you may say intensive groundwork has been done it is still true that, due to the overburden, there may be a simple proportion of the total number of acres in an area which has been intensively prospected which have still not been prospected at all?

MR. EDGAR: Yes, exactly.

COMMISSIONER GAINER: What does the electrical supplement to the magnetic work add to the operation, Mr. Edgar?

MR. EDGAR: Well, some sulphide deposits, major deposits of sulphide, may not have any particular magnetic characteristics which will be detected by a magnetic survey, but they will respond to the electro-magnetic methods because they act as conductors, as a copper wire, for example, and by means of the electro-magnetic methods these sulphide



deposits can be located.

COMMISSIONER GAINER: It works on the principle of differential conductivity. Isn't that the idea essentially?

MR. EDGAR: Actually it is based on the generation of induced electrical currents in the sulphide body on the ground by means of alternating current set up in a very large coil in an aircraft going over the ground, and the induced electrical field built up by the making and breaking of the alternating current from the generating plant is then detected by another coil in the system, which indicates there is a conductor in the ground. You don't know anything about it in the ground except that there is a conductor in the ground and then, of course, you must examine it by drilling or whatever system is used.

COMMISSIONER GAINER: Then when you speak of the magnetic response, obviously iron would be included. What else would respond magnetically to the method?

MR. EDGAR: I think we are getting into a technical field when we start exploring the magnetic permeability of various minerals.



COMMISSIONER GAINER: My interest is in trying to evaluate how far particular methods would go in providing information with regard to prospects. Would it be fair to say electromagnetic methods would give you slightly broader coverage?

MR. EDGAR: Well, actually, experience has shown that you must have a combination of the two to have the most successful pin-pointing techniques. Both the electromagnetic and the magnetic features when present indicate the occurrence of conductors. Whether or not the conductors may be sulphide ore bodies or just graphite is another question, and you have to get out on the ground to find out.

COMMISSIONER GAINER: It would be of interest to me to know whether this applies to sulphide or to two or three or half a dozen compounds.

MR. EDGAR: Mainly to metallic sulphides. Zinc, for instance, will not respond because it is not a conductor.

COMMISSIONER GAINER: Any compound of zinc?

MR. EDGAR: Well, the zinc sulphide will not respond to that and show on the conductor. Lead will act as a weak conductor, graphite, of course, is an excellent conductor and will respond very quickly.

COMMISSIONER GAINER: I do not want to go into the whole thing too deeply.

MR. EDGAR: Some of them will respond and



some will not and their method of occurrence, of course, has to be such that they are touching one another so you can in effect get a continuous conductor. I merely wish to point out that these techniques have been very successfully employed in other parts of Canada. In the Pre Cambrian it has been extremely successfully employed in areas where there have been no rock exposed at all and they have resulted in the finding of mineral deposits which are actively under exploration at the present time. In my opinion there is a fertile field here for the same sort of technique to be employed.

THE CHAIRMAN: Will those techniques work as well in other rocks as they do in the Pre Cambrian?

MR. EDGAR: I believe so. I do not think it makes any difference as to the host rock.

THE CHAIRMAN: It is just coincidence that you referred to the use that has been made of it in the Pre Cambrian?

MR. EDGAR: Well, except that the Pre Cambrian is regarded as being certainly the most potential area to find the deposits in.

MR. FOUKS: These aero-magnetic surveys are made by the Dominion Government?

MR. EDGAR: Yes, and also on behalf of private companies by operators who are in the business.

MR. FOUKS: Would these private operators



have done the same thing over and above government surveys?

MR. EDGAR: Oh yes indeed.

MR. FOUKS: So if we have a company in Toronto saying they spent an "x" amount of dollars on a survey, would that include this type of survey as well?

MR. EDGAR: Yes, they would do both the magnetic and the electromagnetics at the same time.

MR. FOUKS: This may be a wrong question to ask and the Chairman can pose it, but if the company indicated they had surveyed this area, a large company, and had made certain claims, would you in your opinion feel they would have done an aero-magnetic survey?

THE CHAIRMAN: Name the company.

MR. FOUKS: International Mines. Would they have done that, in your opinion?

MR. EDGAR: Yes indeed.

MR. BISHOP: It may be of some interest to the Commission to see one of these maps. This one has no particular significance, but I think it is near Waterways. That is the type of map that results from aero-magnetic surveys.

THE CHAIRMAN: I think this would be a convenient time to adjourn. We will adjourn now until two o'clock.

--- Luncheon adjournment.



---On resuming at 2.00 p.m.

MR. BISHOP: Mr. Chairman, Mr. Edgar was in the stand when we adjourned at noon. If he may proceed with his remarks -- unless there are more questions.

MR. EDGAR: Mr. Chairman, to continue with perhaps one further example of these geophysical techniques, the study of aerial photographs has also proven to be of very great assistance in developing theories concerning geological structures; and I would like to direct your attention to a publication of the Research Council of Alberta -- Aerial Photographic Interpretation of the Pre-Cambrian Structures North of Lake Athabasca, by J. B. Godfrey, published in 1958, and we have mounted on this board over here two of the maps which are contained in that report. This is described ---

THE CHAIRMAN: Just a moment, please, Mr. Edgar. This is Mr. J. B. Godfrey's interpretation of aerial photographs?

MR. EDGAR: Interpretation of geological structures from aerial photographs.

MR. BISHOP: Shall we enter that as an exhibit, Mr. Chairman, the map and the publication as well?

THE CHAIRMAN: Yes.

MR. FEEHAN: That will be 52-RR.

---EXHIBIT NO. 52-RR: Map and publication of
Research Council of Alberta.



THE CHAIRMAN: Now, is the map you have shown us associated with the report?

MR. EDGAR: It is a part of the report.

THE CHAIRMAN: You are just looking now at a copy of the map?

MR. EDGAR: This was taken from the report.

MR. BISHOP: Mr. Chairman, the map is ordinarily folded up in an envelope at the back of the report.

MR. FEEHAN: The report is here, sir.

MR. EDGAR: Well, the significance of this work, it seems to me, is that, as has previously been stated to you, I think, the geological structures in the Pre-Cambrian have had some influence on the deposit of the Pine Point lead-zinc deposits, and the possibility must not be overlooked that similar geological structures in other areas may conceivably have similar bearings on the overlying Paleozoic formations which could conceivably have similar deposits of lead and zinc and other ores as well, and this work of Godfrey's is an interpretation of the aerial photograph, showing the major structural features contained in the Pre-Cambrian formations.

One of the significant features is in this bend in the Athabasca river, a big loop, which contains a number of lineaments, or, presumably, may be faults or shear zones, which, when projected, would come out under the Paleozoic formations and which could



conceivably, perhaps, be indicative of structures that might lead to the discovery of ore deposits in the Paleozoic.

THE CHAIRMAN: Where does the Paleozoic start?

MR. EDGAR: More or less along the edge of the river; perhaps a little to the east of the river, but the end of these red lines could be considered to be the edge of the Pre-Cambrian.

A second major structure, geological structure, is contained in the Lake Athabasca trend, and it is believed there may be large fault structures tending to the southwest, and these are projected -- the exploration work on the projection of these things again could be productive of mineral deposits; at least these are indications that might lead to good prospecting on the ground. So that one must not necessarily assume, just because there has only been one Pine Point, that there cannot be another one; the same structural conditions exist which, if projected below the Paleozoic formations, can contain good prospecting ground.

COMMISSIONER GAINER: What is the relationship between an orebody such as the Pine Point type and the Pre-Cambrian? This is distinctly associated with the Pre Cambrian, although there is a fair amount of overburden on it.

MR. EDGAR: Actually there has not been



very much disclosed by the Consolidated Mining and Smelting Company on the results of their work, but I think it is generally believed that the underlying basic formations, the structures in the underlying basic formations are reflected in the overlying Paleozoic formations in such a way that conditions favourable for mineral deposition are present and possible post-Paleozoic faulting movements may have opened up channels where the mineralizing solution got in, and it is these structural conditions -- similar ones may possibly be found in these other areas, and a study of the aerial photographs and the interpretations can lead to other deposits possibly being found.

COMMISSIONER GAINER: What could you say, in terms of existence, where you move west of the Pre-Cambrian outcrop? Is there likelihood of the faults continuing being projected west as it is closer to the obvious part of the Shield?

MR. EDGAR: Well, of course, that is quite a difficult one to answer since you can't see, but these structures are major ones, are large ones, and as such are expected to continue for some distance at least below the overlying formations. I believe, for example, on the Macdonald fault along the south shore of the Great Slave Lake has been traced west almost to the mountains and eastward for a considerable distance. I think it has actually been traced for a matter of 600 or 700 miles, so these major structures



have continuity, and where they can be observed to go into the overlying Paleozoic formations, I think there is every reason to believe that they will continue for a considerable distance, and if other conditions are favourable, the possibility exists that other formations will be found.

COMMISSIONER GAINER: Would it be fair to say that, generally speaking, the further west you proceed in this area, while conditions of formation may be the same, they could exist?

MR. EDGAR: Yes.

COMMISSIONER GAINER: Even though the chances of something being there might be equal, say, along there. Is it your opinion that the Pine Point deposition is definitely associated with the Macdonald Fault?

MR. EDGAR: I think there are a number of factors involved in it, but I believe that the Macdonald Fault certainly has some bearing on the formation itself.

MR. FEEHAN: Would you say that there is a greater likelihood of finding an orebody in the Paleozoic than there is over the Pre-Cambrian?

MR. EDGAR: No, I wouldn't say so.

THE CHAIRMAN: You referred to the article written by Mr. Godfrey. Is that all you wish to say about it? You have given us the highlights of it, have you?



MR. EDGAR: Yes, that is right, Mr. Chairman.

THE CHAIRMAN: The significance of his work is that he points out there are structures in the area between the two lakes, Lake Athabasca and Great Slave Lake?

MR. EDGAR: He is mainly concerned with the northeastern corner of Alberta. I think his observations were confined to just that area of Alberta which is contained in the northeastern corner.

THE CHAIRMAN: Did he see many structures there?

MR. EDGAR: Oh, there are a great many of them. It is criss-crossed with them, major faults and major lineaments, indicating geological structures.

THE CHAIRMAN: Mr. Edgar, it has been suggested to us that in a lot of the area east of Slave River and between Lake Athabasca and the Great Slave Lake there is a lot of granite and gneiss, and that is not, generally speaking, regarded as a suitable area for prospecting. What do you say to that?

MR. EDGAR: Well, sir, perhaps one of the best examples of that might be in the Thomson Lake area in Manitoba where the International Nickel Company is carrying on work there, and those nickel deposits are in gneisses. The major part of it is a gneiss. Whether it is of granitic origin or not is another story.

THE CHAIRMAN: There are some intrusions



between the Athabasca and Great Slave Lake, and there is no doubt that that area could contain some minerals; but where the granite and gneisses are you consider is an area which is also worth prospecting?

MR. EDGAR: Yes.

THE CHAIRMAN: Are there many places where granite and gneisses have been found?

MR. EDGAR: I would say that they are in the minority.

Again I would refer to Thomson Lake, the nickel deposits there, but possibly it is only because there has been more effort put into an examination, a close examination of gneissic areas in recent years than there has been previously.

THE CHAIRMAN: Would you say there is a trend in the direction of looking at gneissic areas?

MR. EDGAR: Well, I would say they are receiving a lot more attention than they used to give to them years ago. It was thought that deposits were found in volcanic and sedimentary formations, and granite prospects were virtually eliminated from prospecting activities. I think today large areas are being examined much more carefully than they would have been ten or fifteen years ago.



THE CHAIRMAN: It has been thought, has it, that ore bodies are likely to occur where there is an intrusion in another type of rock other than granite?

MR. EDGAR: That is true.

THE CHAIRMAN: Is it possible you may find places where granite appears at the surface but the intruded rocks are at a shallow depth, they do not appear, but when you apply the method you have been referring to you may find something in them?

MR. EDGAR: Yes, I would say that is possible. However, the effective range of electromagnetic methods depends on a number of factors and it is usually - the depth penetration of such surveys might be expected to be of the order of 200 to 300 feet only so that anything very much deeper than that would more than likely not be turned up by aerial surveys. Ground surveys might very well go deeper than that and give indications at a greater depth.

COMMISSIONER GAINER: Speaking structurally, this would not be an uncommon type of occurrence where the intruded rocks might not quite reach the surface but might nevertheless - -?

MR. EDGAR: Yes, I think that is a fair estimate of it.

COMMISSIONER GAINER: Nothing about the process in its historical structural region would mean that the intruded rocks were not there or else



they came to the surface?

MR. EDGAR: Oh no, not at all.

THE CHAIRMAN: You have pointed out to us that 80 per cent of Canada's minerals come from the Pre Cambrian. Is it possible that Pre Cambrian has been prospected more thoroughly than other areas and that might be something to do with it being more productive than other types of rock are?

MR. EDGAR: Well, perhaps in terms of aerial distribution I would say that considerably more than half of the country is Pre Cambrian rocks.

THE CHAIRMAN: Pre Cambrian rocks which are exposed?

MR. EDGAR: Which are exposed.

THE CHAIRMAN: What would you say the proportion is of Pre Cambrian rock that are exposed to other rocks which are exposed?

MR. EDGAR: Well, this map of Canada on the wall over here might give you a better answer to that.

THE CHAIRMAN: Can you see an exhibit number on that?

MR. EDGAR: Just map number 3, principal mineral areas of Canada.

THE CHAIRMAN: Map number 3, that is attached to your report, Mr. Grimble?

MR. GRIMBLE: Yes.

THE CHAIRMAN: Very well, we know what



it is.

MR. EDGAR: The pink area outlines the Pre Cambrian area essentially. In the interior plains region we have the paleozoic and masozoic regions and they also occur in the Arctic regions.

THE CHAIRMAN: In the interior plains the rock is not exposed. No-one would think of doing prospecting in the immediate vicinity of Edmonton, would they? You cannot see the rock?

MR. EDGAR: That is quite right. There are large areas of Pre Cambrian in British Columbia, in the Cordilleron region, but they also do not show up. In answer to your question about the area, I would say there is considerably more than half of Canada underlain by exposed Pre Cambrian rocks.

THE CHAIRMAN: And the rocks that could be looked at would constitute, would you say, 20 per cent of the country or more or less?

MR. EDGAR: Well, the Cordilleron belt of course constitutes good prospecting country as well, and I should say this area might be regarded as being perhaps 10 per cent of the total area of Canada - 10 per cent to 15 per cent.

THE CHAIRMAN: That is the area which more or less coincides with British Columbia and the Yukon?

MR. EDGAR: Yes sir, that is right.
The interior plains region looks like it might con-



tain about, a slightly larger percentage, perhaps 20 per cent of the area and I think the balance of it would be regarded as Pre Cambrian.

THE CHAIRMAN: Well, is this a fair estimate that the Pre Cambrian constitutes 50 per cent of the area of Canada, the Cordilleron belt constitutes 10 per cent which is one fifth, about one fifth of what the Pre Cambrian is? I think from the figures you gave us this morning it produces about one eighth as much minerals as the Pre Cambrian itself.

MR. EDGAR: I think that is about correct.

THE CHAIRMAN: The Pre Cambrian is more productive than the other, but not a very great deal more productive?

MR. EDGAR: Oh, I think very much more so.

THE CHAIRMAN: Proportions of 5 to 8 - twice as productive considering the area?

MR. EDGAR: I would like very much to study that a bit before making a statement about it, but certainly the major portion of Canadian metal production comes from the Pre Cambrian.

THE CHAIRMAN: 80 per cent?

MR. EDGAR: I believe that is right, those are the figures.

THE CHAIRMAN: Well, would you expect a great deal more to come from the Pre Cambrian than anywhere else because there is so much more Pre Cambrian exposed?



MR. EDGAR: Yes.

THE CHAIRMAN: But even then the proportions seem to be higher in the Pre Cambrian than anywhere else?

MR. EDGAR: That is the object of the exposition.

THE CHAIRMAN: Would you say the Pre Cambrian has been prospected a little more carefully than other parts of Canada?

MR. EDGAR: I would be inclined to think so, because of the fact that it has been settled for a longer period, and there have been more people prospecting it for a longer period of time. Also, it is much easier to get into, its accessibility is much greater than many of the mountainous regions.

COMMISSIONER GAINER: Mr. Edgar, one other point and this might be taken as a bit afield, but are you able to comment in some fashion on the eastern part of the Cordilleron region and the lower Mackenzie there? Do you know that area particularly west of Great Bear Lake?

MR. EDGAR: I have travelled through parts of that country and seen some of it.

COMMISSIONER GAINER: Has it been prospected to any great extent or is there any reason to suppose in the long term sense that it might be productive or as much so as any part of the Cordilleron?

MR. EDGAR: Well, actually the Pre Cambrian - the contact between the Pre Cambrian and the



paleozoic rock runs through the western part of Great Bear Lake and in the country immediately west of there and out into the Yukon. You are in the great plain belt really and I would say that mineral prospecting in there would probably not be too fruitful.

COMMISSIONER GAINER: I was really speaking of just west of the Great Slave, the Cordilleron on the west side of the river. Has that been prospected up the rivers that flow into the Mackenzie.

MR. EDGAR: Oh, I think it has been prospected some. We read of early exploration activities by some of our famous people in the geological survey. There has been some privately financed prospecting in that country. It is quite inaccessible, and I would say that it has probably not received intensive prospecting.

COMMISSIONER GAINER: It might well be something to be reckoned with I suppose in terms of productivity as compared to even the Pre Cambrian east of it, would it?

MR. EDGAR: Oh, I would certainly say there is a possibility, yes indeed. There is a great deal of work going on in the Yukon, of course.

THE CHAIRMAN: Mr. Feehan?

MR. FEEHAN: No questions.

MR. BISHOP: I was going to suggest just for the record that possibly Mr. Edgar should explain



to the Commission just what the various lines on Dr. Godfrey's map signify. I do not think that was brought out. I think it should be brought out that Dr. Godfrey is a member of the Alberta Research Council which probably explains why his work is confined to the corner that goes to the Saskatchewan boundary and the Northwest Territories boundary.

MR. EDGAR: Well, these red lines that appear on the map are traces of lineaments that appear on the aerial photographs. In the preparation of these two maps Dr. Godfrey has compiled a mosaic of all the air photos in that area by tracing from photograph to photograph, by tracing the lineaments that appear in the pictures he has produced all these structural lines and trends. Some of them he regards as overlays, others show the presence of folds. Where the lineaments can be traced around the folds they show up quite clearly, but they should be regarded as the main geological structural features as interpreted from the air photographs.

MR. BISHOP: I think that is all I wanted to bring out, Mr. Chairman.

THE CHAIRMAN: Are there any further questions? Thank you very much, Mr. Edgar.

MR. EDGAR: Mr. Chairman, I had one other point that deals more or less with the statistical occurrence of mineral deposits that I would like to mention. Again, this has a bearing on the occurrence



of mineral deposits in the Pre Cambrian that I think should be given some thought. That is in connection with the iron deposits on this map of Canada which shows a portion of the United States. We have very large iron deposits in Northern Michigan on the south shore or just south of Lake Superior. Coming north - incidentally, this is not very far from the edge of the paleozoic, it is in the Pre Cambrian, but the edge of the paleozoic formation runs in a line something like that. From there we step across into Ontario to the Steep Rock area where there is a very large iron deposit. There are scattered smaller deposits in Western Ontario in the Kenora district. In Manitoba near Neepawa there is a very large magnetic anomaly overlain with paleozoic and masozoic formations. The formations are a matter of 2,000 to 2,500 feet thick. There has been one drill hole put down into the basement formations and has recovered hematite ore. The anomaly is a very large one covering much more than 30 square miles. A little further to the west up in Saskatchewan, Kelsey Lake there is a similar occurrence of magnetic anomaly. That has had a number of drill holes put down it and has shown the presence of magnetite ore. A little further north in Saskatchewan there is scattered occurrences of magnetite in the Gray Lake area. West of there in the Black Bear Lake there are indications there through this area be-



low the aero-magnetic surveys. That anomaly goes up the Clearwater River. At the east end of Lake Athabasca there is an occurrence which is north of Black Lake, an occurrence of magnetic iron that has not been developed. With these occurrences scattered along the edge of or close to the paleozoic Pre Cambrian contact purely from a statistical point of view I think it is quite significant. I think that these aero-magnetic surveys might very well show us that there are other occurrences that perhaps are not quite so deeply buried under the paleozoic and it might be a source of iron ore for development in the area that we are discussing.

In terms of ore, I think it is quite significant when we talk about ore and the Pre Cambrian that has been explored, it is possible to take in one mineral claim which contains an area of roughly 50 acres, one could expect to find an ore body containing millions of tons of iron ore or other ores, base metal ores. When considering the very large areas that remain to be explored and the fact that an ore body could be found on a very, very small acreage comparatively speaking, there still remains a tremendously large area of the Pre Cambrian in this area that we have been discussing that can be considered as very potential prospecting ground. I think that is about all I can say.

MR. FOUKS: I wonder if you would comment



on a newspaper story. To use Mr. Grimble's approach this is just hot off the press in today's Edmonton Journal, and I will read it out and perhaps Mr. Edgar could comment on it:

"BASE METALS RUSH DEVELOPING IN NORTH: A rush to stake mining claims for base metals in the region east of Great Bear Lake, some 200 miles north-west of Yellowknife, is reported by prospectors reaching Edmonton. High quality copper and molybdenite have been reported.

Steve Yanik, a prospector who arrived here this week, says it is reported that Eldorado Mining and Refining Ltd. which undertook an extensive exploration program this year, has staked 1,000 claims.

In addition 500 claims in the region have been staked by independents and probably another 1,000 will be taken before the end of this year, said Mr. Yanik.

"Just as soon as there is enough ice for planes to land, more claims will be staked", he added.

MADE STATEMENT: W. M. Gilchrist of Ottawa, president of Eldorado, when queried by The Journal, made the following statement.

"An aerial geophysical survey of a wide area to the east and south of Eldorado's Port Radium mine indicated that certain areas would warrant investigation by diamond drill and other surface



exploration methods.

"A certain amount of drilling will be done this fall but the major effort will take place in the 1960 season. I cannot say at the moment whether or not the anomalies will produce ore bodies or, even if commercial ore bodies are found, what metals they will contain."

Northern prospectors say the region that is the centre of present interest is 70 miles in length and about two miles in width. In this region, there are indications from surface showings of copper, nickel, uranium, molybdenite and silver. Samples brought out include bornite, which is a high grade of copper.

BIGGEST NEWS: "This appears to be the biggest thing that has hit the north for some time," said one mining man.

There is one exploration party on the ground and other major companies are reported to be showing interest in the possibilities of the region.

"This looks like the important news we have been waiting for," said G. H. Finland, manager of the Alberta Northwest Chamber of Mines. "We are keenly interested in a grass roots development which would mean a lot to northern mining."

Bruce Macdonald, an Edmonton consulting geologist voiced similar views concerning the importance of northern area possibilities."



ANGUS, STONEHOUSE & CO. LTD.
TORONTO, ONTARIO

Edgar .

2157

I just want to reiterate one point, the area is the "region east of Great Bear Lake some 200 miles northwest of Yellowknife". Would you like to comment on that?



MR. EDGAR: Well, not having been there since this activity developed, I am afraid I am not really in a position to say so; but I think, if Mr. Macdonald is here, I prefer really to leave the question for him to comment on.

MR. BISHOP: Mr. Chairman, could we leave this until Mr. Macdonald comes on the stand? He is quoted in the article in question, for which we thank Mr. Fouks saving us the trouble of bringing in.

MR. FOUKS: I thought you would, Mr. Bishop, and that is why I saved you the trouble.

MR. BISHOP: I feel that this bears out what Mr. Edgar was explaining to the Commission this morning about the effects and hopes of airborne magnetic surveys. But before Mr. Edgar steps down, I would like to ask him whether he can give us any information about the present status -- maybe Mr. Macdonald can do this better -- of the iron ore deposits at Black Lake and what is known about them and possible markets, if any.

THE CHAIRMAN: Where is Black Lake?

MR. BISHOP: Black Lake is the fairly large area at the east end of Lake Athabasca.

MR. EDGAR: Well, I can say that the deposit which lies just north of this large island in Black Lake has really not been given anything more than a cursory examination; it has not been diamond drilled. It is reported to be some 1500 feet in



length, it has been traced that far to date, and it has a width of up to 300 feet and regarded as an excellent low grade iron ore. Its metallurgical properties are excellent, it separates and concentrates readily, and if it were closer to Edmonton the chances are that it would be exploited today. I believe that it is held by private interests at the present time and it will more than likely continue to be held in that way until such time as it can be exploited.

COMMISSIONER GAINER: Are you able to comment in a similar fashion on the Clear Hills Iron deposits?

MR. EDGAR: Well, beyond stating that investigations have indicated an extremely large tonnage of low grade ore, which is perhaps much more accessible because of the fact that it is only a matter of 25, 35 miles from the end of the existing railway, it has certain metallurgical properties which have got to be studied and I believe are being studied at the present time.

COMMISSIONER GAINER: Are these considered to be favourable or unfavourable or difficult, do you know?

MR. EDGAR: I should say that there are always difficulties with metallurgical problems, but I don't think these would be any more insurmountable than any others.

COMMISSIONER GAINER: But with reference to the Black Lake deposits, would you have any comments



about them as to the metallurgical properties?

MR. EDGAR: I don't think that the Black Lake deposits have received as much attention as the Peace River deposits. But in its degree of purity I would say it is certainly comparable, and I am advised by people who have had something to do with the exploration of the deposit that, strictly from a concentrate point of view, it is an excellent deposit in that respect.

COMMISSIONER GAINER: Peace River?

MR. EDGAR: Black Lake.

COMMISSIONER GAINER: You haven't the same comparable information about the Clear Hills one?

MR. EDGAR: Not as yet.

MR. BISHOP: That is all, Mr. Chairman, unless you have more questions.

MR. MACDONALD, called

MR. BISHOP: Would you, for the benefit of the Commission, give us a short history of your qualifications and experience?

MR. MACDONALD: Mr. Chairman, I am a graduate geologist of the University of Toronto, in 1939. From 1939 to 1942 I was employed in various mines in the Pre-Cambrian, up in the Timmins area, Kirkland Lake camp. After the war I returned to Porcupine, where I was until the spring of 1951, and for a period from 1947 to 1951 I was also acting at times as an independent consultant in areas such as Pine River, the Gowganda Field, Cobalt, but the



bulk of my time was spent in Porcupine. In 1952 I joined Eldorado Refining as Chief Geologist in their Beaver Lodge uranium area, which post I held until the winter, the early spring of 1955, at which time I left them and entered the private practice which I am now holding. I spent the bulk of my time in the north, northern Alberta, northwest Saskatchewan, the Northwest Territories, the Bear area, and I have been out in British Columbia and Yukon. But the bulk of my time has been spent in the Pre-Cambrian, the area which is now under study.

MR. BISHOP: Mr. Macdonald, you have been here during the testimony of Mr. Edgar, so I think you understand pretty well what the Commission has in mind. So we would like you to give us the benefit of your thoughts on the possibilities and probabilities in the Pre-Cambrian and the area with which we are concerned right now and also the Paleozoics in the area through which the eastern route would pass.

MR. MACDONALD: I believe, Mr. Chairman, you mentioned a little while ago to Mr. Edgar that it was definitely considered that the area east of Slave River was considered to be mostly granitic and gneisses. Now, according to the map, that actually would appear so. Unfortunately, we have not got the map extending to the east.

MR. BISHOP: Mr. Macdonald, would you refer to the exhibit number on that map, please?



MR. MACDONALD: Exhibit 52-B and Exhibit 52-C.

MR. BISHOP: The third map does not have an exhibit number, Mr. Chairman; I think it has been added afterwards, so it should have a number now.

MR. MACDONALD: The actual area under study is not completely covered by this map, but the pink areas which we see here are usually referred to on the map as granites and different phases of granites, including gneisses. Now, in my experience, and in others, too, in detail work in this area there are a great number of discrepancies show up on the ground, and all these maps are prepared by the Geological Survey of Canada and are excellent efforts but are not designed for detailed work in the field; they merely act as an indication of what the overall geology of the area is. One example is the recent activity of Mr. Hirshorn's interests in this area here, where he found cobalt and nickel mineralization for the most part is associated with the base intrusion. Now, on this map there is no indication of that intrusion; it is all shown as a mass of granite or granite diorite.

COMMISSIONER THOMSON: Where is that?

MR. MACDONALD: It is on this structure here. It is the next structure which parallels the Rutledge river. I do know that the mineralization is associated with the base intrusion.



Now, there is no reason why a repetition of those positions cannot be found anywhere in this entire area. As you will also notice, all these unfilled areas -- the mapping has mostly taken place along the water routes and the intermediate areas which are a little more inaccessible. There are metamorphic rocks which we call sediments, and they are actually considered more favourable than the straight granitic-gneiss. But there are chances of other bodies of gneiss material as well as base intrusion anywhere through this zone, I feel.

As far as known orebodies in the Pre-Cambrian are concerned, unfortunately we have none in this area -- at least none which are considered economic at the present time. There is one mine -- at least a mining plant; it cannot be considered a mine -- but there is a mining plant on the east part of O'Connor lake. I forget the name of the mine; it is one of the Burns interests. At the time the inaccessibility of metal markets generally precluded any action. I believe that was about 1953 or 1954. I believe that they opened that up and sank a shaft there, and there has been no work done since then. It is possible that, if an access route were put in this area, the O'Connor Lake property might be opened up. Now, I don't know; I haven't been talking to the Burns people and I don't know their feelings, but I imagine, with an access route in there and possibly if there



is any improvement in the metal markets, that the Burns will undoubtedly look into the area again.

THE CHAIRMAN: What did they find there?

MR. MACDONALD: Lead-zinc. It was an exploration shaft, channel and grade.

THE CHAIRMAN: They were not thinking of taking any concentrate out?

MR. MACDONALD: I don't know the answer to that, sir. But that is the only mining plant in the area lying between Athabasca and Pine Point. It is not a complete mining plant either; there is a head frame.

THE CHAIRMAN: It is designed only as an exploratory mine?

MR. MACDONALD: Yes.

COMMISSIONER THOMSON: How deep did the shaft go?

MR. MACDONALD: I don't know. I think there were two levels, if I am not mistaken.

THE CHAIRMAN: How far is that from Slave Lake?

MR. MACDONALD: Approximately 30 miles.

THE CHAIRMAN: From Slave Lake?

MR. MACDONALD: Yes. I would say the nearest point would be here, approximately 30 miles.

THE CHAIRMAN: How far is that from the mouth of the Slave River?

MR. MACDONALD: It would be approximately



30 miles.

Now, in addition to these two areas I have mentioned, the Hirshorn nickel-cobalt area here and the lead-zinc, there are numerous other showings, as we call them, prospects, all through this area. Going east into this belt of sediments, of course, we have---

THE CHAIRMAN: Going east from O'Connor Lake, is it?

MR. MACDONALD: Yes, almost due east.

THE CHAIRMAN: How far?

MR. MACDONALD: That would be about 50 to 60 miles.

THE CHAIRMAN: In that stretch from O'Connor Lake east for 50 or 60 miles?

MR. MACDONALD: That is right. Now, at McGinnes Lake we had quite a rush develop a few years ago in uranium. There were one or two deposits which might have been economic if they had been either on Slave Lake or Athabasca, but the fact is that they were isolated up there, with no roads, and everything depending on air and there was no underground work carried on in this area.

Now, in the Taltson River-Nonacho area there are numerous showings of lead, some zinc, a little gold and some silver and other minerals, such as the fluorite, and some iron spotted here and there. Up in the La Roche River there is some staking going on now on some lead and silver. I am not sure of



the exact area, but the La Roche River enters into Slave Lake and originates from the Taltson River.

This area has not been flown in detail, as far as I know, by any private company. There have been attempts by certain mining interests which have selected limited areas and have not done airborne magnetic and electromagnetic work on them. As far as I know, there have been no large units used. The units that have been used are small enough to fly in, say a 180. That is a Cessna 180, which is a small aircraft and it has a limited capacity. So just how elaborate the units they have used are I don't know, but I don't imagine they would be as efficient as a larger unit or a larger aircraft.

-

-

-

-



As far as I know the Hirshorn interest picked this anomaly for the Cobalt nickel. I believe they found that as a result of their airborne magnetic work, that is using the small aircraft.

I have agitated over the past several years for an area on the south shore of Slave Lake to be flown. I feel that there is a potential there, a base metal potential. There are innumerable showings all along the shoreline and I have had occasion to examine a number of them, in fact, I have just returned from an examination in this area. There is a great deal of mineralization all along this shoreline. Now, there has been a lot of prospecting, but most of the prospecting has been done from the water. Anyone familiar with the topography in that area can see where a prospector might lose heart. He will be prospecting on the lake and he will come up against the Macdonald fault which is a very sharp expression rising for several hundred feet almost sheer. I feel the Macdonald fault is barriered for prospecting in the conventional manner and the area south of the Macdonald fault offers a considerable potential. I believe the Hirshorn interest have done odd aerial work along there, but I am not aware of any results they have found.

That briefly sums up the Pre Cambrian. There are hundreds of other areas of mineralization that I know of. Should there be deposits of economic



proportions it has not been presented, it has not been mapped. What has been done has been along the water routes. There is a lot of the interior that has never been touched or scratched and the geology, although basically accurate in details is inaccurate - I should not say inaccurate, but there is a lot of the geology lacking that I feel is there.

As far as airborne work goes, as Mr. Edgar pointed out, there is a lot of low ground and a lot of people consider that the low ground is extra favourable and actually it is. Very low ground represents a weakness in your formation - a weakness either caused by a structure or maybe a softer type of rock. Usually when you have a lineament of any extent and no outcropping the chances are you have a reasonable structure or a major structure, there is no outcrop. You at least do airborne work, or a survey on the ground is the only way to find out exactly what you have. With a little encouragement on that you can go a little further with diamond drilling, etc. etc. There is an awful lot of low ground and if you look at Dr. Godfrey's map you will see a lot of these lineaments are muskeg and there is not much rock on them. I feel airborne work in this area would be advantageous but it is hard to convince some of these larger companies to spend the time and money in this area because it is inaccessible. I have approached several mining companies in the east, not only in this area



but in the north and east and their answer is,
"If you find anything what will you do with it?". If
it was gold or uranium, anything like that, there is no
problem because you can supply the concentrate, but as
far as base metals go you have to have an access road
or railroad or something like that. I feel that there
has been a lot of interest that has been waylaid in
this area simply because we are in the middle of no-
where. It is awfully easy for the Bay Street boys to
raise money in Metagami and other areas in the east,
but they look at a map like that and they say, "Well,
from here to here is a long way off, what will you do
with it?". It is a lot harder to raise money for work
in this area than it would be for the same thing in
the east.

Now, there has been a lot of talk about
Pre Cambrian but I consider the paleozoics over on this
side as being potential ground as well. There has
been mention about structure and I have looked them over
and there is every indication of a continuity to the
west of the Slave River underlying the paleozoics.
The Wood Buffalo Park in this area over here which
covers a large area of the paleozoics under review, I
am just not sure what the acreage is altogether, but
I feel that the paleozoics there actually which are
the continuation of these over here, the paleozoics
there within the Wood Buffalo Park are excellent
hunting ground right now. I have seen samples,



admittedly from Indians, but I have seen samples of excellent lead that has been reported as being found within the limits of the Wood Buffalo Park. The Indians are allowed to hunt in there but the white prospector is not allowed within the limits of the park for any prospecting purpose. There is no reason why there should not be a repetition of Pine Point through that area, but as long as the park stands the way it is there is not much hope of finding anything there. As the rules stand now, they are very rigid and I understand that even if you are forced down there in an aircraft you are in trouble. I feel that the railroad going up to Slave River or in that general direction would probably mean that the park boundary would have to be shifted or a new ruling taken on the purpose of the park and have it reclassified as a reserve or preserve, but not as a provincial park. As a provincial park it precludes any prospecting.

Mr. Fouks read that article a little while ago on the Eldorado combine and that is an example. I might just show you where that is. On exhibit 52 (b), here is Bear Lake, Port Radium, approximately 60 or 70 miles east of Bear Lake to the north of the river here. Now, there is a zone on the river here which represents a strong topographic feature, a fault. There is a length of 70 miles there, in fact, this whole area, as I understand it, has been flown by Eldorado using both the magnetometer and electro-



magnetics in the air. As the result of airborne work there is a belt of volcanic sediments extending for, well, we do not know the northern limit because it has not been mapped. On the map sheet that covers this area the sediments or the sedimentary volcanic belt extends for a length of probably 100 miles. In contact to the west are granites and granite gneisses. In contact to the east are granite gneisses and metamorphic rock in general. This airborne work showed up a large number of anomalies or conductors. On the ground they have not had a chance to do any work, but as far as I know they expect to stake all the ground they need which has over 1,000 claims just as the report states. There have been a number of independents in there staking ground and there has not been much publicity as yet, but I feel it is an important area structurally and I think probably this winter we will see a fair bit of activity in that area. It is not too far off the proposed road that leads off from Slave Lake to Bear Lake. I am not aware of the location of the road, but I presume it will end up in a copper mine, so it may not be too far off the road which would probably add impetus to development in the area. Again, if it is base metal, which we presume it is from the samples I have seen it is very good looking copper and as far as Eldorado is concerned I have not seen anything of the ground which is adjacent to Eldorado, but I assume it is



a base metal area. In that case if it proves to be they will have to think of ways and means to get concentrates out.

THE CHAIRMAN: You spoke of the area on maps 52 (c) and 52 (d)?

MR. MACDONALD: Yes.

THE CHAIRMAN: Can you point out a spot which appears in the green portion of the map?

MR. MACDONALD: Yes, McInnes Lake. That was the centre of the uranium rush back in 1954 or 1955. The rush developed and there were several claims staked in that area and a great deal of interest was shown in that area. A lot of money has been spent but unfortunately no mines were turned up, although there were one or two prospects that I worked on and if there had been either on Slave Lake or Lake Athabasca I probably would have recommended some serious work to be done on them. The fact that they were isolated and the only means of access being by air and your air rate being so expensive, we decided there was no further work we wanted to do on the area and it died a natural death. Then, of course, there was the indecision as to the future of uranium anyway and there has not been too much interest. On the Taltson river area - -

THE CHAIRMAN: On the McInnes Lake area you say you do not recommend any serious work because of access. Suppose there had been a winter



road in there, would you have felt differently about it.

MR. MACDONALD: Well, if there had been a winter road I might have recommended a little more work, survey work. There were some interesting results on the diamond drilling and had we been at Lake Athabasca where we had at least barge transportation and daily air schedules from Edmonton, I think I would have recommended a prospecting shaft and a certain amount of underground development work. However, up here I would never have done that.

THE CHAIRMAN: What could be done for an area like that to make it interesting?

MR. MACDONALD: Well, I believe this road will eventually be coming around the loop and should not pass too far from the route in question.

THE CHAIRMAN: That is the road proposed from Fort Smith to Reliance?

MR. MACDONALD: Yes, I believe it is starting out of Yellowknife now and will eventually wind around. Actually this map shows the north-west corner of McInnes Lake. Now, since uranium there has been copper, lead and zinc in that area and some of the larger companies have spent a fair bit of money in that area, but have not turned up any large deposits to warrant a program.

THE CHAIRMAN: What kind of access would you propose for an area like that to make it feasible?



MR. MACDONALD: I would not recommend any access unless there were some mines almost in the stage of being proven. It is excellent prospecting country, but there are no mines actually proven. The thing is to interest the public in doing a little more work in there, some of the mining companies doing a little more work. If things stack up and it looked as though some mines would develop, then I would say a road would be a necessity.

THE CHAIRMAN: From Fort Smith or - -

MR. MACDONALD: I feel Fort Smith would be the logical start.

THE CHAIRMAN: That road, I suppose, would be to take supplies into this exploratory effort, would it?

MR. MACDONALD: Yes.

THE CHAIRMAN: Would a winter road be sufficient?

MR. MACDONALD: Yes, a winter road to start with would be ample. You can always supplement your road if it was not accessible by a certain amount of air freight.

THE CHAIRMAN: But you would not recommend a road unless you saw something to put the road in for? You would not put the road in first?

MR. MACDONALD: As I say, I think that whole south shore is very important. I have not really considered the road there at all, although



I am aware it has been proposed and I believe approved, but I was not considering this road in this question at hand. I think a road through there would be a wonderful thing, but right out of a clear blue sky, I would not recommend a road in there now as far as developing mineral resources. I think for tourists and things of that kind it is a wonderful thing and it undoubtedly will end up with one. I think a fair bit of mineral exploration will be advantageous and it could well lead into the economic products.

THE CHAIRMAN: Suppose an economic ore product was found there, what do you think should be done.

MR. MACDONALD: It depends on the kind of product; if it is gold or something like that, I think a road would be ample, but if it is a base metal, you would have to depend on rail.

THE CHAIRMAN: It would not be any good unless there was a rail from Fort Smith or Pine Point.

MR. MACDONALD: It would depend on where the ore body was, but in base metals you have to transport the concentrates.

THE CHAIRMAN: Would it be feasible to take the concentrates to the lake and carry them by water?

MR. MACDONALD: Well, your season is limited.

THE CHAIRMAN: There is one line on the



Hudson Bay?

MR. MACDONALD: Yes, North Rankin, but that is a seasonal operation. I believe it is shut down now.

THE CHAIRMAN: What do they produce at North Rankin?

MR. MACDONALD: It was nickel, but it is not operating at the present time. I think they shut down this summer or spring.

THE CHAIRMAN: Shut down permanently?

MR. MACDONALD: I believe so. I am not sure of that, but it seems to me I saw that in the Northern Miner a few months back.

COMMISSIONER GAINER: When they were operating was it not a year-round operation? Did they stockpile or did they shut down in the winter?

MR. MACDONALD: I am not prepared to answer that.

COMMISSIONER GAINER: I have one question: You mentioned the paleozoic region or part of it would be of some interest to you, does this apply to any part of the paleozoic area there or are you speaking mainly of the contact.

MR. MACDONALD: Along the contact. We favour the contact because you have shower rocks overlying the formations, but as you walk away from the contact your exploration gets much more difficult. The area immediately south of Pine Point,



in between there and Slave River is the area that I consider most favourable at the present time.

COMMISSIONER THOMSON: Supposing that this thing got to be a big base metal operation, how would you propose to take the ore out.

MR. MACDONALD: That is a hard question to answer off-the-cuff. A lot depends on the size of the deposit, the number of deposits.

COMMISSIONER THOMSON: Let us suppose it is an enormous deposit as we hope it will be.

MR. MACDONALD: Then, it is a question that Eldorado would have to answer.

COMMISSIONER THOMSON: Let us suppose it does not belong to Eldorado at all, let us suppose it is base metal, how would you get it out. Suppose you were a consultant and had to decide that question for a group, how would you get the ore out.

MR. MACDONALD: It would mean a lot of study before I could answer that. I am not too familiar with the area and as far as the getting out question, that would come under mining engineering and not mining geology.

THE CHAIRMAN: Would you mind outlining the area that you referred to a few minutes ago that you think is promising? You said south of Pine Point and west of Slave River.

MR. MACDONALD: The Wood Buffalo Park boundary is so. The eastern boundary on the Slave



River is here. Now, the area that I have been told and have been shown samples of lead is in this area, roughly in this area. I am not able to pinpoint it and not able to vouch for the story but it came from a person whom I contacted in the area and whom I consider a reliable man. However, I would not like to say definitely the samples I saw were picked up in this area.



But the structures coming from the Pre-Cambrian are numerous. As Mr. Edgar pointed out, one of the major ones is through here. You can pick up those structures in the Paleozoic, underlying the Paleozoic, and has some bearing on the Paleozoics. There is some expression in the Paleozoics here. I would say this whole area north of the Peace, say, up to Pine Point, is the most favourable. As you work down here, I would say it is less favourable; not that the mineralization is not there, but it becomes less economic to work.

THE CHAIRMAN: You say that the area which is favourable is one bounded on the west south of Pine Point at the Peace River?

MR. MACDONALD: Well, say, east of Buffalo Lake.

THE CHAIRMAN: A line drawn just to the east side of Buffalo Lake?

MR. MACDONALD: Copp Lake. Now, I have no reason for saying that other than I would consider the exploration possibilities a little easier, more economic, in that area, a little further west.

THE CHAIRMAN: The west boundary would be about the west side of Copp Lake?

MR. MACDONALD: Yes, through Copp Lake, roughly.

THE CHAIRMAN: And running more or less south through Great Slave Lake to the Peace River?



MR. MACDONALD: Yes.

THE CHAIRMAN: The south boundary would be the river?

MR. MACDONALD: Yes.

THE CHAIRMAN: How far east would you go?

MR. MACDONALD: Well, right up to the Slave River.

THE CHAIRMAN: Why do you stop at the Slave River?

MR. MACDONALD: I am speaking of the Paleozoic. I am thinking primarily of lead and zinc.

THE CHAIRMAN: Now, do you consider that area as favourable an area for prospecting as the area to the east of the Great Slave Lake, or do you feel like comparing them?

MR. MACDONALD: Yes, I like the Paleozoics. I don't see any reason why all the mineralization should be confined to Pine Point itself. There are other regional structures, admittedly not as strong as the Macdonald Fault, but there are similar types of structures which extend to the east side into the Pre-Cambrian. But basing it on a structure pattern, I would say it stands a fairly good chance in that area of the Paleozoic.

In the east we are in a different type of rock again and you might expect a different type of mineralization in the Pre-Cambrian. You can find lead-zinc, sure, but it all depends --



the mineralization is dependent on your structure, the type of rocks. In some areas the rock is more favourable; it depends on the pressure, the temperature and the chemical composition, and one type of rock might be favourable and another type might be unfavourable.

THE CHAIRMAN: Do you like the area to the east of Great Slave River as well?

MR. MACDONALD: I like the area east better; it is larger. I think it offers more variety. It is a much larger area. It all depends on whether you take the area to the west of the Great Slave, but the immediate -- if I had to do anything immediately in this area, I think I would look for a similar situation as we had in Pine Point in along the margins of the river. But as a regional picture, I prefer the area east of the Slave; it has more potential, more variety of mineralization.

COMMISSIONER THOMSON: Did you have any knowledge of the work done across from Pine Point in Sulphur Bay?

MR. MACDONALD: No, I haven't followed that.

COMMISSIONER THOMSON: Would that be a good prospect there? It is the same type of rock.

MR. MACDONALD: Yes, the same type of rock; but not the structural picture. As I say, I shouldn't really talk on that subject. All I know is a little



bit I picked up from certain mining companies operating in the area and who were a little tight on their information.

COMMISSIONER THOMSON: I understood they went in there strictly as a structural bed.

MR. MACDONALD: I believe there were some showings.

COMMISSIONER THOMSON: Twice during this Commission I have suggested there might be other Pine Points could be found in this Paleozoic area, and I was told they were not. Now, you would be inclined to say there would be another Pine Point?

MR. MACDONALD: From the knowledge I have, I don't see any reason why you can't find any mineralization in the Paleozoic, whether you go north or south of Pine Point.

COMMISSIONER THOMSON: I think twice I was contradicted and told it would be very unlikely.

THE CHAIRMAN: I think once you were misunderstood, Mr. Thomson.

Have you anything more you want to discuss, Mr. Bishop?

MR. BISHOP: I don't think so, Mr. Chairman.

THE CHAIRMAN: Suppose we have a five-minute adjournment and Mr. Fouks would have the chance of discussing any questions he may wish to ask with you.

Does this cover the question of mining?



MR. BISHOP: I would like to develop further the informal questions you brought up at noon, but we are not prepared to do that now.

THE CHAIRMAN: You don't intend to do that this afternoon?

MR. BISHOP: No.

THE CHAIRMAN: You have dealt with the fuel oil and asphalt from the Royalite plant, sulphur, silica sand and gypsum. Do Mr. Edgar and Mr. Macdonald deal with that or Mr. Grimble?

MR. BISHOP: I think Mr. Grimble will deal with that. I think apart from Mr. Fouks' questions we have developed all the information we intend to through Mr. Macdonald and Mr. Edgar.

THE CHAIRMAN: I would like to ask some questions about these other matters that appear on the bottom half of page 41.

MR. BISHOP: What I meant was that we are through asking questions of these two gentlemen.

THE CHAIRMAN: I don't want to let Mr. Edgar and Mr. Macdonald get away and then ask about sulphur and find out I am asking Mr. Grimble when I should have asked these two gentlemen.

MR. BISHOP: I think we can keep them on hand, sir.

THE CHAIRMAN: We will adjourn for five minutes.

---Short recess.



THE CHAIRMAN: Mr. Feehan, have you any questions to ask Mr. Macdonald?

MR. FEEHAN: I have one or two, sir.

Mr. Macdonald, you started off your remarks by saying, I think this phrase, "The area which is now under study". What did you mean by that?

MR. MACDONALD: The area from -- well, at least my interpretation of the area was the area from Lake Athabasca to Slave Lake, both east and west of the Slave River.

MR. FEEHAN: Now, what I was wondering was who gave you the impression that was the area under study?

MR. MACDONALD: From a geological point of view.

MR. FEEHAN: Your instructions were to consider this area only, I suppose?

MR. MACDONALD: No, I had no specific instructions at all. I had just returned from the North and had not been following the Commission; the reports have been more or less isolated. All I was aware of was that there were the two proposed routes, and I was requested to appear and elaborate or supplement any remarks that Mr. Edgar might have on the geology in the Pre-Cambrian and the area adjacent to the Slave River and the Athabasca Lake.

MR. FEEHAN: I think you expressed the opinion that in comparing the Paleozoic with the



Pre-Cambrian, that is the areas east and west of the Slave River, that you would rather prospect in the Pre-Cambrian east of the Slave River.

MR. MACDONALD: Yes, I did.

MR. FEEHAN: Would you rather prospect, if you had a choice and the money, south of Slave Lake or north of Slave Lake?

MR. MACDONALD: That is a difficult question. I think they are both potential areas and there is a lot of mineralization and economic minerals in the northeast arm of the Slave Lake. I think it is primarily because there was a great deal of emphasis placed on that area at a time that gold was first discovered, but I also feel there is a lot more prospecting in that area since the gold discoveries than there has been in the area south of Slave Lake, and I don't see any reason why that area should not be of equal potential.

MR. FEEHAN: Would you not feel that the area south of Great Slave Lake is far more attractive to prospect than the area north to prospectors?

MR. MACDONALD: No, not necessarily so. In one sense it is nearer to civilization, if that is what you mean, but once you are in the bush and you are following up, as the earlier prospectors did, a few more weeks or days as far as a prospector goes is nothing; he may as well go on and stop at Athabasca. The old prospectors had all the time in



the world, and all they needed was some flour and a few beans.

MR. FEEHAN: You don't consider it is easier to prospect south of the lake than it is north of the lake?

MR. MACDONALD: Well, topographically speaking, the north is easier. The area immediately on the south of Slave Lake has a natural barrier formed by the escarpment of the Macdonald Fault, and that is a considerable barrier for working out of Slave Lake into the south. Now, the Taltson River, the Snowdrift River and the La Roche River are all entry points from the Slave Lake into the south, and they are hazardous areas, too. But I am not saying there has not been prospecting done there, but there has not been the emphasis as in the area that I have mentioned.

MR. FEEHAN: I would like to draw your attention to a statement made previously by Dr. Hume at page 1445 of the hearings, and, in answer to a question of Commissioner Gainer, Dr. Hume said -- I would like you to comment on this afterwards. It is rather long, so I will read it. He is referring to this particular area between the two lakes.

"Well, I think all I can say about that is these areas, to the mining companies, and to the government parties making geological maps which is the basis for the prospecting in



most areas, are fairly readily accessible now. It is not difficult with a plane to get into most of these areas. The individual prospector hasn't a chance to do this, but there aren't any any more -- or, very few. Most of the prospecting is done by the major mining companies sending out parties which are well equipped with float planes, which are quite capable of not only moving the party from lake to lake, but they move all the camp and all the equipment and do it very efficiently and quickly. So that the area has been quite accessible to prospecting, and no mines have been found other than those at Uranium City. That doesn't preclude, as Mr. Jewitt said -- and I agree with him -- that mines may not be found in that area; but, I would say, as I said yesterday, that in my opinion at least, the mines in an area should come first before the building of a railroad through that area."

Would you care to comment on that particular statement by Dr. Hume?

MR. MACDONALD: If you had the money, the area is accessible; you can fly, there is lots of water, there are air bases at Yellowknife and Uranium City. If you had the price you could cover the area by either a boat or a plane. The average prospector hasn't got the money and he finds it extremely difficult



to get the backing. I can mention three mining companies who have float planes in that area who have undoubtedly done some very excellent work, but I don't think for a minute that the area has been covered; it is an extremely large area.

I am not sure whether I am on record with this, although I mentioned it at some point -- maybe it was out in the hall -- that the areas that have been prospected in detail are those adjacent to water routes, where the prospector on his own can paddle up the waterway, maybe venturing half a mile inland. But the portions which are not on a water route -- I don't think the ground has been scratched. The large companies have been in the area off and on, but I don't consider that as a reason for wiping out an area. I mean, an exploration company, no matter who it is, is only as strong as the man in the field.

MR. FEEHAN: Would you go along with this statement -- and I believe it is mentioned on page 1446 -- that it is less interesting to prospect in that there is more granitic rock in that area than other parts of the Pre-Cambrian Shield?

MR. MACDONALD: Well, although the entire area is shown as granitic-gneiss, I don't think it is necessarily so. There have been base intrusions with nickel-cobalt and other mineralization, there



is silver and lead, and the O'Connor mineralization, which is lead and zinc, are not granites. I think the maps are excellent as a basis for prospecting, but they are actually not too good for the ground.

MR. FEEHAN: It has been said that many of the major companies were in these territories within the past twenty years and have given them up because of the fact that they are so highly metamorphic, and that is the reason why they have given them up today and that is the reason why they are not so well prospected as the rest of the country.

MR. MACDONALD: Well, there have been a number of large companies in there all right. Of course the Metagami area was wiped out, too, until they flew it. Chibougamau was another one that was looked at for the last forty or fifty years, and there was nothing as far as the experts were concerned.

THE CHAIRMAN: You mean the experts said there was nothing?

MR. MACDONALD: Yes. But I mean you have not an active camp there now, but you have some producers.

MR. BISHOP: If I may interrupt, we have a clipping from The Northern Miner apropos of that last question of August, 1939, concerning the finding of the Metagami orebody by aerial geophysics, which I think is relevant. May I enter that as an exhibit?



ANGUS, STONEHOUSE & CO. LTD.
TORONTO, ONTARIO

Macdonald

2190

MR. MACDONALD: I personally know men who
are considered experts in their field who were in the
Metagami area quite a number of years ago and who
wrote it off.

-

-

-

-

-

-



MR. FOUKS: I have one question as a result of that. I would like to go back to the area under study, that is my question, because I could not exactly understand what the area under study was. In answering the question, you said from Great Slave Lake south to Lake Athabasca east and west of the river.

MR. MACDONALD: Roughly, yes.

MR. FOUKS: As far as you are concerned that is the area under study.

MR. MACDONALD: That is the area I was primarily concerned with.

MR. FOUKS: When the question was put to you by Mr. Feehan in respect to the area closer to Great Slave Lake you referred only to the northeast part of the Great Slave Lake. Was there any particular reason why you ignored the northwest part?

MR. MACDONALD: No, except I am unfamiliar with it. I have worked in the northeast in the Pre Cambrian, I have done some work in the paleozoics between Slave and Athabasca, but I have never been on the west of the northwest arm of Slave Lake.

MR. FOUKS: Out of your area, in other words?

MR. MACDONALD: Yes.

MR. FEEHAN: I have nothing further.

THE CHAIRMAN: Mr. Macdonald: you were asked if some large mining companies had been in that area between Lake Athabasca and Great Slave Lake and



you said there have been.

MR. MACDONALD: Yes.

THE CHAIRMAN: And if a decision is made by a mining company to leave an area alone, who makes the decision, the Geological Department?

MR. MACDONALD: Geological, yes. The Chief of Exploration would make the decision.

THE CHAIRMAN: You were the chief at Eldorado Mining Company for a number of years?

MR. MACDONALD: I was, but I had more to do with the mining operation than I had with exploration.

THE CHAIRMAN: Were you in charge of such decisions at the time - -

MR. MACDONALD: No, I was not in exploration, I was in mining.

MR. BISHOP: Do you wish us to proceed on the other aspects that we have touched on on mining?

THE CHAIRMAN: We have come to a dividing line now, have we not?

MR. BISHOP: I think we have, my lord.

THE CHAIRMAN: Very well, we will be going on with the part of your brief that appears on page 41. I think we will adjourn now until tomorrow morning. I suppose it is difficult to estimate how long we will be on this, Mr. Bishop?

MR. BISHOP: I think it is, but I think also most of the remainder of the brief is in the



nature of a summary of all the things we have covered quite thoroughly as we went along.

THE CHAIRMAN: Perhaps we should start at 9.30 tomorrow morning and be sure of getting through this brief tomorrow.

MR. FOUKS: Mr. Chairman, prior to adjournment I would like to make a few remarks. First of all, as I advised the Commission earlier, I will not be able to attend tomorrow. However, Mr. Guest and Mr. Southworth will be here. I hope the Commission will see fit to take the time to have Mr. Guest cover his material tomorrow, because it will be most difficult to bring him back at another time. As you know, he has been back and forth nearly as often as I have.

Just one word on the B.C. Government's position in respect to a rebuttal brief. We will not be in a position to present this for some time. I am going east for ten days and when I return to Vancouver we will attend to it immediately. I would advise the Commission now of our position, because we never thought it would go this length of time.

THE CHAIRMAN: How long do you think you will likely be before you can let us have your rebuttal?

MR. FOUKS: I would say the first week in November would be the approximate time. The reason I say that is because I may not be back to Vancouver before October 26th or 27th and it will



take us a few days after that. The first week in November we will be prepared to present our rebuttal brief.

THE CHAIRMAN: I am not in a position to say anything now, but your application has been submitted and we certainly will give it our deepest consideration.

MR. FOUKS: I hope in your deliberations you will keep in mind this mass of material that has been presented at a very late date, in fact some of it was dated very recently. This makes it most difficult for us to prepare anything until the last minute.

THE CHAIRMAN: I appreciate that there is a lot of material that has come in in the last few days. Is there anything else?

COMMISSIONER GAINER: This is still a written rather than an oral rebuttal?

MR. FOUKS: Yes, it would suggest that we present the oral basis of our rebuttal brief which we are prepared to present at that time.

THE CHAIRMAN: You do not want to do it now?

MR. FOUKS: No, not until all the evidence is in and it would seem you will not finish the Edmonton Chamber of Commerce tomorrow. I will not be able to be in attendance and will have to go through the transcript to get the information.



MR. BISHOP: Would it save the time of the Commission if the rebuttal brief were merely submitted so that another hearing is not necessary?

THE CHAIRMAN: I think perhaps we might leave that until the time comes. When you prepare your brief you may be able to - we can get in touch with you by telephone or by letter and see what the nature of your brief is. You do not intend to give us any oral evidence until the brief has been completed?

MR. FOUKS: No, I do not.

THE CHAIRMAN: Very well, we will adjourn now until 9.30 tomorrow morning.

--- Adjournment.

ROYAL COMMISSION
ON
GREAT SLAVE LAKE RAILWAY

HEARINGS
HELD AT
EDMONTON, ALBERTA

VOLUME No.: 18

DATE:

Oct 16/57

OFFICIAL REPORTERS
ANGUS, STONEHOUSE & CO. LTD.

372 BAY STREET
TORONTO

EM. 4-7383

EM. 4-5865



ANGUS, STONEHOUSE & CO. LTD.
TORONTO, ONTARIO

ROYAL COMMISSION ON
THE GREAT SLAVE LAKE RAILWAY

Hearings of the Royal Commission
on the Great Slave Lake Railway
held in the Court House, Edmonton,
Alberta, at 9.30 a.m., October 16,
1959

PRESENT:

MR. M. E. MANNING	Chairman
MR. WALTER D. GAINER	Member
MR. JOHN ANDERSON-THOMSON	Member

MR. FRANCIS M. FEEHAN	Counsel
MR. A. PATERSON	Secretary



THE CHAIRMAN: Mr. Bishop, have we finished everything on mining in the far north?

MR. BISHOP: Mr. Chairman, we read to the end of the section on mining on page 43, and the portions not completely covered relate to the Athabasca Tar Sands and sulphur and the gypsum at Peace Point, mostly referred to on page 41, and Mr. Grimble has some supporting material on that and I believe you had some questions.

So I will ask Mr. Grimble to proceed.

MR. GRIMBLE: We have been referring to the Gordon Commission, and for mining and mineral processing we have reviewed the Gordon Commission. I have two or three pages regarding minerals out of the Gordon Commission, similar to the way we dealt with agriculture and forestry. These are the Gordon Commission comments regarding the mining industry

THE CHAIRMAN: The mining industry in Canada or - -

MR. GRIMBLE: Actually the export situation and the needs for minerals, and so on.

THE CHAIRMAN: Have you extra copies of that?

MR. GRIMBLE: Yes, we have.

THE CHAIRMAN: Are you filing a copy of this as an exhibit?

MR. GRIMBLE: Yes. Would you like me to read it, sir?



THE CHAIRMAN: Yes, would you.

MR. GRIMBLE: These are extracts from the
Gordon Commission on mining and mineral processing:

"The Commission feels that the prospects for the Mining and Mineral Processing industries are very good. The Commission points out that a study prepared for them 'concludes that world demand for new metal production is expected to be more than double its 1955 level, by 1980, with particularly strong demand likely to be shown for the lighter metals and those additives which are capable of standing higher temperatures and of resisting corrosion. World requirements for industrial minerals are expected to expand by about $3\frac{1}{2}$ times, while the consumption of structural materials, which because of their relative abundance, bulk and low value are consumed mainly in local and domestic markets, are expected to rise broadly in line with Canadian construction expenditures, or between 2 and 3 times.'"

The Commission goes on to say:

"It seems probable, though, that Canadian metal and mineral production will, on the whole, gain relatively to total world mineral output over the next quarter century. The main mineral users, particularly the highly industrialized economics of the United States, the United Kingdom, and Germany are expected to become increasingly



deficient in minerals and will consequently need to look more and more to external sources of supply. Canada should be in a good position to increase its share of these and other nation's requirements because of our substantial proven resources and are still largely in untouched geological potential."

The Commission reaches the following conclusion:

"Producers of structural materials are likely to expand the value of their output some $2\frac{1}{2}$ times -- the dollar amount of industrial mineral production may expand almost 4 times -- the value of metal production may exceed 4,000,000,000 or well over triple their 1955 production."

The Commission examines the probable market and makes the following statement:

"Foreign sales will also absorb a somewhat higher proportion of the industry's output than they do today, so that the share of production going to other countries is expected to rise to more than 70% by 1980. The principle market for our minerals will be the United States and an increasing share of the industry's exports will move to that country over the next quarter century."

The Manning Commission should be particularly interested in the Gordon Commission's remarks concerning the outlook for copper, zinc and lead: - -

MR. BALDWIN: You are ending the quotation



there; it is comment now.

MR. GRIMBLE: This is an introductory remark to the quotation. It is the top of page 9. It says:

The Manning Commission" - that is this Commission - "should be particularly interested in the Gordon Commission's remarks concerning the outlook for copper, zinc and lead , and the quotation is:

"However, despite probably continued slow growth in demand compared with that for other minerals, Canadian producers of copper, zinc, and lead, are expected to gain a larger share of world markets. This is largely because shipments to the United States markets are likely to increase substantially over the long term. The long run trend of requirements in that market has been outpacing supplies available from United States domestic minds, and many American concerns have shown increasing interest in Canadian sources of supply. Growth of the Canadian market will also be of importance, for more than 1/3rd of copper, lead, and zinc production by value has been traditionally consumed at home -- a higher proportion than for any of our other principle metallic minerals."

The Commission examines the possibility of further processing of minerals and make this reference

"Lead, zinc, and nickel, may be smelted and refined close to the mines if low cost energy is



available and outlets for their byproducts can be found, while uranium could fall in this latter class also. Of course, other circumstances like plant construction costs, the availability of chemicals at competitive prices, and assured markets must also be favourable before processing in Canada can be said to merit heavy investments in projects of this type."

This, it would seem to me clearly indicates that the many advantages which the Trail Smelter now possesses will make it very difficult for any other processor to enter the market. The Commission does, however, see some possibility for the processing in Western Canada due to the fact that chemical processing techniques are becoming increasingly important in the mineral industry.

"Petroleum fuels and petro-chemical materials make other methods of manufacturing possible and result in a wider range of byproducts. Western Canada will benefit from these developments, although oil and natural gas are more transportable forms of energy than is electricity. Exported to the United States, they may frequently be supplied at prices and under conditions more favourable than those offered to prospective processors in Canada. In such circumstances, it will be difficult for Canadian mining companies in Western Canada to process minerals prior to export,



particularly as the United States' tariff is substantially higher on imports of processed materials than on materials in the raw state."

The Gordon Commission's conclusion is as follows:

"In summary, the anticipated growth and development of our mining and mineral processing industry is expected to raise the industry to a position in the Canadian economy in which it will surpass forest industries and will fall not very far short of agriculture in its contribution to overall domestic output -- the further substantial growth which is foreseen for the mining and mineral processing industry suggests that in every respect it can be safely regarded as a soundly based and strong contributor to the Canadian economy."

THE CHAIRMAN: What the Gordon Commission anticipated has already occurred, hasn't it?

MR. GRIMBLE: Yes, sir; at least in the export field. In the export field the mining industry ~~has~~ surpassed the others.

THE CHAIRMAN: You haven't shown here what they are.

MR. GRIMBLE: They are in the final report, November, 1957.

THE CHAIRMAN: What is this exhibit?

MR. FEEHAN: 52 (uu).



THE CHAIRMAN: These extracts are taken
from - -

MR. GRIMBLE: From minerals and mining. It
starts at page 211.

--- EXHIBIT NO. 52 (uu): Extracts from Gordon
Commission Report.

MR. GRIMBLE: Mr. Chairman, on the subject
of markets, I thought the Commission might be interested
in the Paley Reports' information on lead-zinc demand.
I might say that the Paley Report was possibly more
pessimistic about the supply situation than has been
proved to be the case. This is from volume 2 of the
Paley Report. It was called "Resources for Freedom"
and it was headed "The Outlook for Key Commodities"
and is dated June, 1952:

"Precise estimates of the valuable future
supplies of materials equally cannot be made. In
the case of an abundant material like coal, resources
do not place a serious limit on future supply.
They are ample for foreseeable needs.

A different situation is illustrated by
lead. The output of lead has not only failed to
keep pace with growing demand, but has actually
fallen in recent decades and threatens to remain
low in spite of high prices and a strong demand.
It is probable that discoveries of economic re-
serves will not be sufficient to keep up with the



present level. Thus, a growing gap between the United States demand and domestic production of lead must be anticipated."

Chapter 6 of the same volume:

"The demand for lead in the United States during the coming 25 years is expected to grow about 60 per cent, as fast as the total national output of goods and services. The best that can be hoped for is that domestic mine production will not decline by more than 50 per cent by 1975. The United States will, therefore, have to rely increasingly on imports, the demand for which may be some 60 per cent greater by 1975 than the 565,000 tons imported in 1950. The United States import demand of this magnitude plus the likely growth in the demand for lead in the rest of the Free World would require about a doubling of mine production in other free countries. While production in the other free countries can be expanded appreciably over the next quarter century, it is doubtful that it can be doubled. Thus, it is conceivable that a continuing lead shortage might arise within the next 25 years in the Free World, particularly inasmuch as substitutions away from lead have already gone far in view of the fact that the opportunities for further price inducement substitutions are limited. The result will be a tendency toward a severe rise in the real



price of lead although the rise might be kept down somewhat by the extensive explorations for new deposits and by research on additional substitutions.

In 1950, Canada produced approximately 10 per cent of the lead used in the Free World. The demand for new lead in the rest of the Free World is projected to grow by approximately 78 per cent by 1975. This rate of growth is somewhat larger than the corresponding projected increase in new lead demand for the United States. There is also the possibility of expansion and properties not yet developed or currently being brought into full production. Other districts that may prove to be major sources of lead in the next 25 years may be Pine Point in the Northwest Territories of Canada."

A table is given next showing the consumption of materials in the United States in 1950 as projected to 1975 and shows the projected increases. For copper they expect an increase of 45 per cent, lead 61 per cent, zinc 38 per cent, iron ore 54 per cent, nickel 100 per cent, chromite 100 per cent, molybdenum 170 per cent, cobalt 340 per cent, manganese 187 per cent, sulphur 110 per cent, petroleum 110 per cent, natural gas 138 per cent, electrical energy 260 per cent.

THE CHAIRMAN: That is all from chapter



6?

MR. GRIMBLE: That is all from chapter 6 of the Paley Report. We have a few notes on zinc and Pine Point. There is a bulletin taken from the Department of Mines and Technical Surveys. It is called Memorandum Series No. 137 for 1958. I would like to read it.

"Zinc is one of the most important metals used in modern industry, and of the non-porous group is exceeded in World consumption by copper and aluminum only. Its chief uses are for coating steel products to inhibit corrosion, for dye casting and for alloying with copper to produce brass. Of the zinc producing countries, Canada is second largest both in the output of refined zinc and in the overall production which includes zinc contained in ore concentrates exported to other countries. The United States is a principal producer and consumer of zinc. Since Canada's reserves of zinc ore are, as far as known, larger than those of any other country, the outlook for the continuation of Canadian zinc production in important quantities seems assured".



"The properties located near Pine Point on the south shore of Great Slave Lake between the outlets of the Slave and the Hay Rivers comprises over 1000 claims extending about 36 miles northeasterly along a mineralized belt roughly 3 miles in width. The company is a subsidiary of Cominco with Ventures Unlimited holding a minority interest.

"The rock formations in the area are fairly flat lying in Devonian sediments. The ore occurs as a replacement in a bed of coarse dolomitic limestone. There is considerable variation in thickness of the overlying strata, but a number of locations have been found where open pit mining appears practical. The ore zones vary in thickness from 40 to 150 feet. The property has been explored by the drilling of holes at 1000-foot intervals along north-south sections spaced one mile apart and more closely spaced drilling has been carried out in areas of greater than average mineralization.

"Two shafts have been sunk, one to a depth of 98 feet, the other to a depth of 160 feet. From the latter, 660 feet of lateral development has been done. The grade of the ore varies considerably throughout the mineralized belt, the ratio of zinc to lead is generally four to one, but in some sections lead predominates.



"No statements regarding ore reserves have been published by the company, but unofficial reports indicate an ore potential of 120 million tons, about 5 million tons being available for open pit mining, with an average grade of 7.4 per cent zinc and 4 per cent lead.

"The N-42 orebody is estimated to be 1000 feet long and several hundred feet wide and 50 feet thick and could contain over 2 million tons, averaging more than 10 per cent combined lead and zinc. Preliminary ore dressing tests have shown that high grade zinc and lead concentrates can be produced. Tentative plans to bring the property into production include a concentrator to treat 10,000 tons of ore a day. Production, however, is predicated on the building of a railway to the property over which concentrates would be transported for treatment at Trail.

"Indian Mountain Metal Mines Limited:

A number of zinc occurrences have been located in the Indian Mountain Lake area 6 to 8 miles north of McLeod Bay on Great Slave Lake. The ore occurs in folded sedimentary beds striking northeasterly. Diamond drilling on the company's property has indicated 924,000 tons averaging 10 per cent zinc, .85 per cent lead and 3.45 ounces per ton of silver to a depth of 650 feet. There has been little activity



in the area since 1952."

There is a publication on the review of copper, lead and zinc experience compared with the predictions of the President's Materials Policy Commission published on February 15th, 1959. I notice that this was an exhibit received elsewhere with others of this type and I will not bother to deal with it.

THE CHAIRMAN: That will be Exhibit 52-VV.

---EXHIBIT NO. 52-VV: "Resources for Freedom,
Volume II."

MR. GRIMBLE: I might go back and deal with some of the items mentioned in our brief. One, I think, was regarding the Royalite development at the Athabasca tar sands. This is not mentioned in the brief, but one observation I would like to make is the fact that Royalite in their pilot plant operation have run into the problem of transportation. They estimate that the added cost to their pilot plant is due to the difficulties in transportation. They now expect the increase in their costs will be 3 per cent. They point out that the commercial plant that they visualize would be built, should their process be found economic, is in the order of \$50 million to \$75 million, and that they could anticipate this same 3 per cent, or some more, to apply to the transportation costs of equipment and supplies for construction only of this operation.



THE CHAIRMAN: How much do they figure the commercial plant will cost?

MR. GRIMBLE: \$50 million to \$75 million, depending on size and other factors which they will find out in their research.

THE CHAIRMAN: And they think they will have the same kind of increase there?

MR. GRIMBLE: Actually larger, because the vessels and equipment will be large and bulky, and very heavy units such as towers and tanks.

COMMISSIONER THOMSON: Are these figures in the report?

MR. GRIMBLE: No, these are figures after their brief -- as a matter of fact, what prompted this, the Chairman asked Mr. Hay whether he thought the lack of transportation could be a factor in whether the project would go ahead or not go ahead, and Mr. Hay's answer at that time was that it could be. In order to assist this I asked the Royalite people, Cities Service, what they estimated their added cost on transportation alone would be due to the lack of access, and they worked out this 3 per cent figure. They pointed out too at that time that the lack of transportation for the construction of the plant plus the lack of transportation for by-products and goods and services for the operation, and the townsite and the plant, could be the difference between success or going ahead and not going ahead.



It is conceivable, of course, their operations could be a tremendous success and \$1½ million, which would be 3 per cent of the cost, would have no bearing on whether they went ahead or not. It is conceivable, however, that it could be a failure and then there would be no doubt about going ahead. But, somewhere in between there is going to be a point where a decision has to be made as to whether it is economical to go ahead and the \$1½ million in added construction costs, plus the problems of shipping out to the north and south their by-products, may mean the difference between going ahead or not going ahead with the commercial plant.

THE CHAIRMAN: Have you anything more to say about Royalite?

MR. GRIMBLE: I was going on to gypsum.

THE CHAIRMAN: Before leaving Royalite I want to ask more about that. On page 41 you say:

"The refined oil products from the plant would be transported by pipe line south; however, fuel oil and asphalt for Lake Athabasca and the North could move north by rail."

As I recall it, Mr. Hay was not able to give us any estimate as to the cost of the fuel oil and he had no comparisons between the cost of the fuel oil that could be produced and the cost of other sources of power that might be available at Pine Point.

Have you had anything more since then?

MR. GRIMBLE: We are not in a position to



say what the cost of fuel oil would be from Mildred Lake and I do not think Mr. Hay is. Mr. Hay did say, of course, that if the project was a success they intended to be competitive. We did look into the aspects of moving oil by water to Pine Point from the Royalite plant if there was not a railroad, and, of course, without any competition at all it is obvious that with the rehandling necessary Royalite would not be in a position to supply Pine Point competitively with any other point. If the railway went through the western route it is obvious they would not be able to supply from their Mildred Lake plant; they would have the problem of shipping by water, transporting across the portage, shipping by water, transferring to the tank truck at Ile du Mort or some other location, and moving to the mining site. It is obvious they would not be competitive in that case. That does not need any calculations.

THE CHAIRMAN: There have been no discussions with the Pine Point Mining Company, serious discussions, I take it, as to the prospects of supplying the Pine Point Mining Company with fuel from Mildred Lake?

MR. GRIMBLE: I can only go by what Mr. Hay told the Commission the day he was here.

THE CHAIRMAN: You do not know anything more than what they have already told us?

MR. GRIMBLE: No, I do not.



COMMISSIONER GAINER: Mr. Grimble, the movement that you refer to here, transporting refined products south, is that the same setup as Mr. Hay has given us to understand it was not a question of piping their whole product ---

MR. GRIMBLE: A large part of their production will be coke, sulphur and asphalt, and it could be silica sand, and these are things that could not be transported by pipe line; they would have to go south by transport.

COMMISSIONER GAINER: That is what you mean by crude refined products?

MR. GRIMBLE: Actually, I think I said refined by-products. They do anticipate that coke will be a large portion of their production and they could be competitive in the eastern coal market with this coke.

COMMISSIONER GAINER: Will that go by pipe line?

MR. GRIMBLE: No, that would be by rail.

THE CHAIRMAN: Do they think they can produce coke there more economically than could be produced on the Crow's Nest Pass?

MR. GRIMBLE: As a by-product I think they could ship coke to the eastern markets cheaper than coal. They will replace the United States coal on the eastern market if they are successful. I do not know too much detail about this except what I heard



them discussing at various times.

COMMISSIONER GAINER: That seems to be their one main marketing approach to market the coke?

MR. GRIMBLE: Yes, I think possibly even their discussions with Pine Point may have been on the basis of using coke as a fuel for power. I received this impression from listening to Mr. Hay and Mr. Connell when they were discussing it at the hearings.

THE CHAIRMAN: I think Mr. Jewitt told us that coke had been considered and it was decided it was not practicable, but the question of the fuel oil was still open. As I recall it, there had been no discussions between the two companies.

MR. GRIMBLE: There had been discussion; Mr. Hay said they had been approached by Pine Point Mines. There is a twofold approach, one was whether it was feasible to produce the power at Mildred Lake and transport the power or whether they would be in a position to serve them with oil.

THE CHAIRMAN: Are you sure they discussed the possibility of being served with oil?

MR. GRIMBLE: This is in the transcript -- it must be in the transcript because I heard Mr. Hay say it. He said the Pine Point developers had approached them with the twofold approach and one was the fuel oil and the other was the production of power at Mildred Lake.

COMMISSIONER GAINER: This was a



diesel operation?

MR. GRIMBLE: Yes.

COMMISSIONER GAINER: Has Calgary Power ever given consideration to a thermal plant fired by some other fuel? This has never entered into the discussions?

MR. GRIMBLE: I do not follow you.

COMMISSIONER GAINER: At their Pine Point location they never considered anything but a diesel plant or a hydro plant; they have not considered a thermal plant using coal, or even some other type of fuel?

MR. GRIMBLE: Mr. Jewitt mentioned that if gas was available within 100 miles it would have been considered but they would not consider gas feasible if it was anything further than 100 miles away from Pine Point. I think he said at the time, too, he mentioned the coke. I forget just what he did say regarding coke.

COMMISSIONER GAINER: What I have not been able to understand is this: it seems to me from the evidence of Mr. Jewitt that the only thing that had been considered was the diesel generation of power other than the hydro.



MR. GRIMBLE: Yes, I think that is seriously considered.

COMMISSIONER GAINER: But the use of oil has never been considered for firing boilers in the thermal plant.

MR. GRIMBLE: Yes, I see. They use bunker C. I haven't followed that closely.

COMMISSIONER GAINER: Has that been done?

MR. GRIMBLE: I don't know, sir. It may be that Mr. Hay was referring to that in his project, that what they produce for this purpose would be difficult to transport by pipeline.

COMMISSIONER GAINER: It wasn't mentioned in that connection, it was only mentioned in connection with oil for diesel engines.

MR. GRIMBLE: I think if it was bunker C or somewhat heavier, then a pipeline would be out of the question, and Mr. Hay must have been thinking of thermal production for power.

COMMISSIONER GAINER: That was my impression, although I didn't get that impression from Mr. Jewitt. Are you able to tell us anymore about the product mix at Royalite or what a similar operator would be likely to turn out? I haven't cleared up for myself what proportion there would be, might be possible.

MR. GRIMBLE: I have the Blair Report and several other reports on tar sands, but I can't



say that I read them or studied them thoroughly enough to review it.

COMMISSIONER GAINER: I just wondered if you happened to have information from your studies of Royalite that might indicate what kind of product mix they had in mind.

MR. GRIMBLE: I looked into the silica sand more because I wasn't interested in the petroleum end of the business.

THE CHAIRMAN: Mr. Grimble, you referred to the fact that you heard some discussions amongst the officials of the Royalite Company indicating that they are talking about the prospects of replacing coal in the eastern markets with coke.

MR. GRIMBLE: Yes.

THE CHAIRMAN: I have heard something expressed about coke in the Crow's Nest Pass. It seems to me that it is a little difficult for us to give too much serious attention to the prospects of the coke from the Mildred Lake area unless you can give us something more definite than overhearing a conversation with the Royalite people.

MR. GRIMBLE: I wasn't bringing it out as an argument; I just brought it out as a question. I hadn't intended to go into that.

THE CHAIRMAN: I presume that you haven't anything more than they gave you?

MR. GRIMBLE: They were prepared to dis-



cuss the coke, they were prepared to deal with this coke feature. That is why I overheard it.

THE CHAIRMAN: They didn't mention it.

MR. GRIMBLE: No. Had the question arisen, I think they would have dealt with it.

THE CHAIRMAN: Do you know? If they have some serious prospect of being able to sell the coke, we would be glad to have it.

MR. GRIMBLE: I could obtain it. I know when we had our discussion prior to coming here they were gathering these figures together and were prepared to give them.

THE CHAIRMAN: That is a little surprising. They were the ones who were volunteering information, not by way of questions we were asking but by way of argument in favour of the proposed eastern route.

MR. GRIMBLE: I think their brief outlined so many tons, and I think if they had had to elaborate on the tonnages they would have been prepared to give it to you.

THE CHAIRMAN: As I recall, we all asked them something about costs; we wanted to see what sort of prospect there was in producing anything, and there was nothing, there was nothing but pious hopes from the Royalite Company. There was no indication, as I recall the evidence, that you could tell whether the situation was anything more than just an experiment.



MR. GRIMBLE: I think this is the case, that they don't want to put too much hope on something that is in the initial stages. But I think these things like silica sands as a by-product may be worth consideration.

THE CHAIRMAN: The by-products may make the venture a success.

MR. GRIMBLE: They are not very much concerned with by-products.

THE CHAIRMAN: You are dealing with by-products and you have mentioned coke, about which you don't know too much now.

MR. GRIMBLE: That is right.

THE CHAIRMAN: What about sulphur?

MR. GRIMBLE: I have some figures on tonnages, and I think the tonnage figure is something like 16,000 tons a year production.

THE CHAIRMAN: If that sulphur were produced, it is suggested it would be to Uranium City.

MR. GRIMBLE: Yes.

THE CHAIRMAN: Doesn't it look as though we are going to have a very big production of sulphur?

THE CHAIRMAN: If gas went through there would be a very big production.

THE CHAIRMAN: They would not have to produce at Mildred Lake.

MR. GRIMBLE: It may be, for the north country to reduce costs. I am quite confident it



would go to Uranium City cheaper. If there would be a drug of sulphur on the markets in Alberta, they would make sure they had competitive markets, because they would have the jump on the Uranium City market.

COMMISSIONER THOMSON: Mr. Grimble, you are talking about coke. Would you visualize the greater tonnage from that plant coming south or going north? Would all these by-products - would the greater proportion come south or go north?

MR. GRIMBLE: I am sorry, sir, I couldn't answer that. I would imagine a greater tonnage would come south if the by-products proved to be - for example, for silica sand alone, the demand is 50,000 tons, and this would be as much as the northern market could take. That is only one item.

COMMISSIONER THOMSON: What about coke, how many tons, approximately? Would it be a figure comparable to two or three times that?

MR. GRIMBLE: If the project was a success and the produced coke as a by-product, it would be many times that. The Canadian import - this is hearsay - is 9 million tons of coal in the eastern market per year.

COMMISSIONER THOMSON: At the top of page 41 you mention if there was iron ore to come out of the Clear Hills you could just extend the railway 25 miles further northwest. It is only 20 miles to Mildred Lake. Could you just not extend it 20



miles and look after the big percentage of their hauling?

MR. GRIMBLE: Yes, it could. But as I pointed out earlier, the possibility of the project going ahead may hinge on the railway being there, and if the project is a tremendous success, then they could afford to build a railroad. There is a bridge there and 25 miles of railroad.

COMMISSIONER THOMSON: But did you not mention a figure of 50 million dollars for the cost of the plant alone?

MR. GRIMBLE: Yes, that is right, sir.

COMMISSIONER THOMSON: Wouldn't a small item of putting in a bridge, 2 million dollars, and another million for putting in a road be a small matter? If you are putting in a 50 million dollar plant, is 2 million dollars or 3 million dollars too big a percentage?

MR. GRIMBLE: It is a matter of economics. But I don't think anyone at this stage can say that the project is enough of a success with a 5 million dollar expenditure. 5 million dollars may be the difference between going ahead with it and not going ahead with it.

COMMISSIONER THOMSON: You indicated that they wouldn't make the decision as to whether they would go ahead unless they got a railway. I am saying that the railway is so close now that they could



make the decision and, if it was necessary, that extra 2 or 3 million shouldn't make a difference. The bulk of the stuff, since it is going south - they could make the decision without a railway in the east, they could still have a railway by continuing another 20 miles.

MR. GRIMBLE: Mr. Hay was asked was the supply of Pine Point a serious consideration as to whether you would go ahead or not, and he said no, it was not significant, but he said the supply to the north is a serious matter to them. So here we have these factors weighing against it: the cost of building it without a railroad, or the cost of building a railroad and then the problem of transporting materials north to supply the north without rail access to the north. These are the factors which would affect it.

COMMISSIONER THOMSON: We will take, say, asphalt going north or sulphur going north. If they had the sulphur and the asphalt ready right there now, it wouldn't be too difficult to get decent rates to take sulphur into Uranium City, and they could take the asphalt. So the fact that the railroad isn't going past their plant and going on north - I mean, if it was at their plant, that should be enough. Whether it went beyond the plant would make not much difference.

MR. GRIMBLE: It is a matter of economics.



MR. BALDWIN: You asked Mr. Hay about it and he said they did contemplate the expenditure of either the bridge or the railroad, but he hoped the government would undertake either the bridge or the railroad; they couldn't afford both.

MR. GRIMBLE: The expenditure is too great to bear themselves, supplying the spur at this time. If the venture was a tremendous success it might not mean much in the overall picture, but the railroad to the north is the big factor in their consideration.

THE CHAIRMAN: I think we should look up the transcript to see what Mr. Hay actually did say.

We will adjourn for a few minutes.

--- A short recess.



THE CHAIRMAN: Mr. Feehan, you have a copy of the transcript of Mr. Hay's evidence, and Mr. Grimble is looking at that now?

MR. FEEHAN: Which specific point was it we were dealing with?

THE CHAIRMAN: We were dealing with the advantages to the Royalite Company of having the railroad going north of Mildred Lake.

MR. FEEHAN: Mr. Grimble is trying to locate the reference.

MR. BISHOP: Mr. Chairman, while we are waiting for Mr. Grimble, possibly we could deal with something else. I think it was the first day we began to present our brief you asked for further information on the trucking cost per ton-mile at Cassiar Asbestos and United Keno Hill. We have a letter from Mr. Gritzuk, which will give you that information. May I read that into the record?

THE CHAIRMAN: Has Mr. Southworth seen it?

MR. BISHOP: Not yet.

THE CHAIRMAN: Very well, read the letter.

MR. BISHOP: This is a letter dated October 7, 1959, from Mr. Nick Gritzuk, manager of the transport division of United Keno Hill Mines Limited and Cassiar Asbestos Corporation Limited, and is addressed to Mr. Grimble:

"I am enclosing a copy of the article



which appeared in September 1959 issue of Motor Carrier Magazine to which I referred you on the telephone.

"I refer you to page 4, table 3, under the C.A.C. Section for RDF-302 fleet, the cost per ton-mile of 5.32 cents was the average of the years 1957-58. Currently for the eleven-month period of 1959 this cost is running at 4.83 cents per ton mile.

"The costing for each respective operation is against the ton mileage accruing from the haulage of concentrates or asbestos fibre as the case may be to Whitehorse. If the backhaul were considered as useful work performed then the total cost per ton-mile would reduce to 3.9 to 4 cents per ton-mile. You can see the ratio of outhaul to backhaul for United Keno is approximately 3 to 1 and in the case of Cassiar approximately 4 to 1. In the case of Keno the backhaul originates in part at Whitehorse or approximately 5000 tons, the other 6000 tons for the backhaul originates at a point midway between Whitehorse and Elsa.

"The backhaul capacity is not fully utilized in either operation and I would say that the backhaul could rise to a point where the outhaul to backhaul ratio was one and one-half or two to one before the backhaul capacity due to the lighter density of diverse cargo



would tax it completely.

"You will note that these costs are developed on all gravel highway operations but with the axle loadings and total loadings as determined by any bridge formulas which existed. I should remark that at no time have any detrimental effects been observed with respect to either structures or the highway. This I feel is important in considering trucking on all gravel highways as the gravel highway represents the minimum capital investment of public funds.

"If I can assist you further in any way please do not hesitate to call upon me."

This is in answer, Mr. Chairman, to an earlier request on your part for information.

THE CHAIRMAN: Thank you very much.

MR. BISHOP: We will file that as an exhibit, including the enclosure in the letter which was too long to be photostated.

THE CHAIRMAN: Is there something significant in the enclosure?

MR. BISHOP: Yes. He refers to a table in the second paragraph of the letter. He says "I refer you to page 4, table 3, under the CAC Section." That table develops the cost and shows how the cost per ton-mile of 5.32 cents is arrived at.

THE CHAIRMAN: Now, that is the cost of their operations in the far north, is it not?



MR. GRIMBLE: The CAC stands for Cassiar Asbestos Company and this is the haul from Whitehorse to Cassiar. I do not know if he has the backhaul figure in but he has worked it out both ways, one with a backhaul and one without a backhaul.

THE CHAIRMAN: Would it be fair to assume that similar trucking might be done on these costs in the neighbourhood of Great Slave Lake?

MR. GRIMBLE: Yes, sir, it would if the operation was as efficient as this one.

THE CHAIRMAN: Is there any reason why it could not be as efficient as this one?

MR. GRIMBLE: Only that there probably are not two Gritzuks in the world.

THE CHAIRMAN: But the road conditions are no worse around Great Slave Lake, are they?

MR. GRIMBLE: No, a road could be built to the same standard as the Mayo highway.

THE CHAIRMAN: A winter road around the Great Slave Lake would be of the same standard as this?

MR. GRIMBLE: Yes, but I do not think you could get these costs on a seasonal operation. This is a year-round operation and if you had it on a five or six months' basis you would have the capital but not the utilization.

THE CHAIRMAN: How much do you suppose it might go up if it was operated on a five months'



basis?

COMMISSIONER GAINER: Just before that, the Cassiar operation is not a year-round operation, is it?

MR. GRIMBLE: Yes, sir. They stockpile in the summer time and refine in the winter time. I know this because I spent two years there. They mine in the summer time and stockpile and refine all winter and haul all winter. As a matter of fact, in his article he mentions the only time of the year that they shut down is when the roads are very icy.

COMMISSIONER THOMSON: Which portion were you considering in the Great Slave Lake area that would not be an all-year round operation if you had a truck road?

MR. GRIMBLE: Anything that was based on a winter road operation.

COMMISSIONER THOMSON: Theirs is not a winter road; it is a year-round road?

MR. GRIMBLE: Yes.

COMMISSIONER THOMSON: Could you not have a year-round road there?

MR. GRIMBLE: Yes, you could.

COMMISSIONER THOMSON: I was thinking of a truck road, not necessarily just a road in the bush in the winter time, but a year-round truck road. In that case could those figures be just the same?

MR. GRIMBLE: If the operation was as



efficient and the same load factors, it could be.

THE CHAIRMAN: Suppose it was a winter road and it would be limited to four or five months, how much do you think the cost would be increased?

MR. GRIMBLE: I think this could be worked out from his table. He has broken down things in very great detail. The total investment is 10 cents per ton-mile. The useful work performed only in moving mine products to railhead is 20 million ton-miles, the total investment is thus 10 cents per ton-mile. All I am saying is, if you only had half a season your investment would probably be 20 cents per ton-mile.

THE CHAIRMAN: You could take this and calculate it?

MR. GRIMBLE: I will make an effort, if you like.

THE CHAIRMAN: Would you do that?

MR. GRIMBLE: I will.



MR. FEEHAN: Would you like that marked now, sir?

THE CHAIRMAN: Yes.

MR. FEEHAN: 52 (ww).

--- EXHIBIT NO. 52 (ww): Letter dated October 7th, 1959 and article in Motor Carrier Magazine.

THE CHAIRMAN: Now, have you found that part of Mr. Hay's evidence?

MR. GRIMBLE: Yes, sir, I have. This is what I was dealing with when I mentioned it. It is on page 538 of the transcript, volumn number 6. The Chairman asked is the Pine Point market a substantial part of the proposed market, and Mr. Hay's answer was: "No, it is not necessarily, but it might be contributing as an important haul to the railroad. But it is not essential to our project." This is the Pine Point alone.

The Chairman asked: "It doesn't make any difference whether yours is going to be a success or not", and Mr. Hay replied: "No. I wouldn't like to say about the total business in the north, but I don't think it would effect our decision".

In other words, Mr. Hay is saying that the Pine Point supplies - it would be possible for them to ship in. It possibly wouldn't be a big deciding factor in the success or failure of the project, but the total supplies shipped to the north



would be the big decision. This would be a larger factor than the Pine Point position.

THE CHAIRMAN: That is the way you interpret that remark.

MR. GRIMBLE: I was listening at the time. That is the way I interpret the remark.

THE CHAIRMAN: Is that all he says?

MR. GRIMBLE: He says: "I wouldn't like to say about the total business in the north, but I don't think it would effect our decision".

THE CHAIRMAN: As far as the total supply in the north is concerned, it is a competitive position, isn't it?

MR. GRIMBLE: Yes.

THE CHAIRMAN: He would like to supply it?

MR. GRIMBLE: Yes.

THE CHAIRMAN: He would like to supply to the north?

MR. GRIMBLE: Yes.

THE CHAIRMAN: There is some from Norman Wells.

MR. GRIMBLE: Yes.

THE CHAIRMAN: Some by truck via Hay River.

MR. GRIMBLE: Yes, and he visualizes, if the railway went through his plant, he could possibly take what went by railway by truck, and he would be in a good position to serve Uranium City by barge, and by going to Bell Rock he would be in a position to take



the million gallons that goes to Fort Smith and he would be in a competitive position to supply what goes to Yellowknife from Norman Wells.

THE CHAIRMAN: You are saying now he is going to be in a position where he can compete with Norman Wells, but when I asked Mr. Hay what his costs were going to be, as I recall, he didn't have any answer to that.

MR. GRIMBLE: No; but he could see if the railway didn't go the eastern route he would be in no position to be competitive.

THE CHAIRMAN: Yes, but that doesn't mean the reverse is true and that he becomes in a position.

MR. GRIMBLE: Other than his statement here: "We intend to be competitive".

THE CHAIRMAN: But he couldn't give us anything on which to base his intentions. It is like the coal business. For many years the coal people have intended to take over that market, but nothing has come of it. The fact is that they couldn't compete in the eastern markets. Now, because Mr. Hay intends to be competitive or hopes to be competitive or sees that he can't be competitive if it goes up the western route, it doesn't help us very much in trying to come to a conclusion as to what value a railway along the eastern route might have.

MR. GRIMBLE: If the railway were along the eastern route and this operation were a success



by itself or by virtue of the railway being there, they are then in the position of having another supply to draw on. Mr. Hay's position is, of course, that they have to meet competition, and there is no use talking prices at this stage.

THE CHAIRMAN: Supposing Norman Wells were to lay down gasoline at Yellowknife and it is going to cost Royalite 40 cents a gallon to produce that gasoline at Mildred Lake, you can write that off entirely, can't you?

MR. GRIMBLE: Yes.

THE CHAIRMAN: Mr. Hay hasn't given us any figures of what the costs at Yellowknife are; he hadn't even considered it, and when he didn't even know what those prices were in Yellowknife I find it difficult to understand how he can very seriously be considered as a competitor at the moment.

MR. GRIMBLE: If this is to be a commercial success and operating entity, it has to compete in Edmonton, in Alberta. So we can assume right away that he is going to be competitive in Edmonton, otherwise the plant wouldn't be built. If he is competitive in Edmonton, he definitely will be competitive in the north.

THE CHAIRMAN: What is he going to be competitive in Edmonton for? The standard - -

MR. GRIMBLE: They plan a pipeline to Edmonton.



THE CHAIRMAN: Yes, but not for standard petroleum products.

MR. GRIMBLE: I didn't get that impression. It would be crude. Be it fuel oil or gasoline - I don't think he plans gasoline - but even with fuel oil he must be competitive in Edmonton to start the operation, and if they are competitive in Edmonton for a commercial product of this size, then they would be in a position to be competitive in the north.

THE CHAIRMAN: The Royalite project is a big one.

MR. GRIMBLE: Yes.

THE CHAIRMAN: And there has been a million dollars spent on it already.

MR. GRIMBLE: He said over 2 million dollars on research and another 2 million dollars on construction.

THE CHAIRMAN: And they hope they may be able to work it up. If the railroad is built it will undoubtedly be of some assistance to them, and a railroad along the east will help this project, if it is at the stage or reaches the stage where it will be nip and tuck whether it is a success or not.

MR. GRIMBLE: It is a big nip and tuck.

THE CHAIRMAN: If Royalite want to get it operating to its maximum efficiency and there is a railroad, then that is a great boost to Royalite's chances of success.



MR. GRIMBLE: Yes, plus serving the northern market if they were competitive in the Edmonton market. So the north would benefit by getting this competition and the industry would benefit by the fact that they were able to go ahead because of the railway.

THE CHAIRMAN: We still have this problem, that we have been getting from the Royalite Company an indication of the type of products that they would have for sale in the north country. It is a different type of product to what the industry normally turns out. We were told that.

MR. GRIMBLE: They use bunker C in the north and they use diesel fuel and stove oil, of course, and I think this would be one of the products they would use.

THE CHAIRMAN: You think so, Mr. Grimble, but can you say for sure?

MR. GRIMBLE: I would say again that they anticipate taking over the Uranium City market, and they must plan to meet that demand. Maybe the research into cost in this regard wouldn't be complete at this time, because they were probably working on the assumption that if they were competitive in the Edmonton market they could look after that market as well. But I am sure in the research they would look into producing a substitute or the same thing. I would think this is a common sense deduction.



MR. BALDWIN: Before we leave that, may I just refer to a page of Mr. Jewitt's evidence. Now, Mr. Chairman, you were making some inquiries about that with regard to a statement which Mr. Grimble ascribed to Mr. Hay as to there being recent conversations, that the Pine Point Company had approached the Royalite people with regard to their position, and I took the trouble of looking up volume 10 of the proceedings, September 29th, and Mr. Jewitt's evidence is found at page 1049, and he said that they had discussed several years ago, no prices were mentioned, and you asked him the question: "Have you had any discussion with them since a few years ago?" and the answer was: "No, not since that time".

THE CHAIRMAN: Would you go on now, Mr. Grimble?

MR. GRIMBLE: I was going to deal with the subject of gypsum.

THE CHAIRMAN: Before you deal with that, what about silica sand? We asked Mr. Hay about that and he said he hoped it would be of some value, and he said he was basing his opinion on something you had said. We have since got a letter from him giving an analysis of silica sand from another part of the oil sands. Can you add anything to that?

MR. GRIMBLE: I have looked at some publications regarding the silica sand up there,



and the conclusion that has been reached by the National Research Council is that silica sand from the McMurray area, the tar sands area, is as pure sand they have tested in Alberta. It has a disadvantage, in the samples they have studied, of being somewhat finer than good gradation for glass-making, but when one considers it is a by-product and they would be producing on a plant basis, they would be able to produce in a day or two to satisfy Alberta in a year; it isn't difficult to see them meeting the demand. They have it already on a belt; it won't be a difficult matter.

THE CHAIRMAN: You said it won't be, Mr. Grimble. Mr. Hay said that they had put some of their sand over screens, and I think it was 20 per cent.

MR. GRIMBLE: Yes.

THE CHAIRMAN: About 20 per cent of sand was of satisfactory size for the manufacture of glass, but he could give us no analysis, except the letter he wrote, and the letter contained .35 per cent iron. That was the analysis of the sand in its natural state. What happens when you take out that 20 per cent? Maybe you will get rid of other impurities or maybe you will end up with over 1 per cent iron. What happens to those other impurities when you screen it hasn't been indicated to us?

MR. GRIMBLE: I might say that the amount of sand required is a small fraction of what they are using, and this would allow them to pick and chose in



the various sizes, and by taking them they may get a coarser or purer sand. But in this analysis, studied by Dr. Lilge in 1945. He says:

"The Fe₂O₃ (0.073 per cent) and TiO₂ (0.024 per cent), however, are low enough to make the sand suitable for glass containers of the variety now being manufactured in Alberta. Magnetic separation of the tailed sand lowers the Fe₂O₃ and TiO₂ to 0.05 and 0.019 per cent respectively, which is definitely within the limits of good glass sand".

THE CHAIRMAN: What is that you are reading from?

MR. GRIMBLE: It is called "Purification of Silica Sand". Alberta Tar Sands suitable for glass manufacturing, by E. O. Lilge, July, 1945, the Research Council of Alberta.

THE CHAIRMAN: Could you mark that as an exhibit?

MR. GRIMBLE: I borrowed it from the library, but what I can do is photostat these pages.

THE CHAIRMAN: That is Professor Lilge of the University of Alberta?

MR. GRIMBLE: Yes, sir.

THE CHAIRMAN: Anything further on silica? Well, we go on to gypsum.

MR. GRIMBLE: We heard that a Mr. Jordan had taken active steps to study the gypsum at Peace Point. Mr. Jordan used to be an employee of Western



Gypsum, and he is now the manager of Loders Lime, along with his son. It is Mr. Ben Jordan and Mr. Jack Jordan, and both of them have been in gypsum production for many years. Mr. Jordan senior is now partially retired due to health reasons, but most of them have been active in this business most of their lives. I received a wire from Mr. Jordan at the time we thought we would be dealing with it, fairly quickly, and it required a wire to deal with the matter. He sent this wire to me, touching the high points of it:

"Re Peace Point gypsum analysis compare favourably with Manitoba and Windermere 95 to 97 per cent $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ if freight rate comparable to Winermere market potential in my opinion may run as high as one hundred ten thousand tons per year. Alberta and neighbouring sections of Saskatchewan and BC consume approximately ninety million sq. ft. of plaster board each year in addition to this a cement plant may use up to ten thousand tons per year".

MR. BISHOP: Mr. Chairman, in this connection you may recall that I showed to the Commission and to Mr. Fouks, and I think to Mr. Guest, a telegram which had to be confidential. Mr. Baldwin wasn't here at the time. It concerns the market for gypsum.

THE CHAIRMAN: Is that the one from Mr. Jordan?

MR. BISHOP: No, the one we have had from



Mr. Jordan which has been read is not confidential.

THE CHAIRMAN: The confidential one has to be marked confidential because it quotes some prices there.

MR. BISHOP: That is right.

MR. BALDWIN: Where is Mr. Jordan? I was wondering where it was from?

MR. GRIMBLE: He is now manager at Loders Line at Exshaw.

THE CHAIRMAN: Mr. Bishop, you think this confidential telegram is one we can summarize in this way, that a responsible business man has said that the quality of this gypsum at Peace Point seems to be good, and if it can be sold at the appropriate plants at the right price, there is a market for it.

MR. BISHOP: That is right, sir.

THE CHAIRMAN: There is nothing more to it than what I have said, is there, Mr. Bishop?

MR. BISHOP: I don't think so, sir.

MR. BALDWIN: That is a fair summary, sir.

MR. SOUTHWORTH: The Department of Statistics in the Government building here indicate the total market of 70,000 tons, in the neighbourhood of 70,000 tons per annum for Alberta. In our brief we point out that approximately 20,000 of this is in Edmonton itself and that the balance would be in other centres.

MR. GRIMBLE: I would like to point out



that the statisticians have pointed out to me that there is now a consumption of approximately 100,000 tons in Alberta, and I think ten years ago there was a consumption in Alberta of 50,000 tons. At that time there were two plants operating in Calgary, operating successfully, using 50,000 tons. It would seem fairly logical that, now the consumption is in the order of 100,000 tons, there is room for at least one more plant, and preferably in the Edmonton area.



MR. FEEHAN: That telgram from Mr. Jordan will be 52-X.

---EXHIBIT NO. 52-X: Telegram dated September 25, 1959, to Grimble from Jordan.

MR. GRIMBLE: One other aspect of these gypsum operations we might think of in terms of this confidential telegram, when I am dealing with this -- I cannot tell you any more -- but here is another piece of correspondence from Mr. Jordan. I asked him if he would mind commenting on the problem of changing sources of gypsum. In other words, did he think it was a big problem if they were getting gypsum from Windermere in Manitoba to now bring in gypsum from Peace Point. There is an inference in the British Columbia brief that this is a very difficult consideration and the operators would be loath to bring in gypsum from a new source.

THE CHAIRMAN: What page?

MR. BISHOP: Page 6 of the British Columbia brief.

MR. GRIMBLE: As I mentioned, if you keep in mind what the confidential telegram says and what I read here, it will probably answer that question. The letter is addressed to our firm and says:

"Mr. Grimble has asked me to express my opinion regarding the problems encountered in Gypsum mills, when changing from one rock source



to another. Based on my experience with two gypsum operations in this country, I would say the change over is not too difficult. Assuming the new source of supply to be of good quality and colour, which are the prime requirements, it is mainly a matter of establishing calcination temperature and time. In addition to this it may be necessary to put certain additives, such as starch, etc., in to the finished product to advance or retard the setting time.

"Yours sincerely,

"J. B. Jordon."

THE CHAIRMAN: What about the question of the price? In the British Columbia brief it says it is \$3 to \$5 a ton. Is that at the quarry?

MR. SOUTHWORTH: The quarry.

THE CHAIRMAN: At the quarry at Windermere it is \$3 and \$5 a ton.

MR. SOUTHWORTH: There is a specific price at each quarry and that is the range at each quarry. I do not know the particular price at Windermere. We took it from the Dominion Government publication on gypsum.

THE CHAIRMAN: And freight has to be added to that?

MR. SOUTHWORTH: Freight is added to the quarry price. As we mentioned when this came up during the presentation of our brief, the question of



rates for moving gypsum was brought up by yourself, and at that time we indicated Mr. Guest would answer that question.

THE CHAIRMAN: What do you say about the cost of transporting this gypsum from Peace Point to Edmonton?

MR. GRIMBLE: The railways have given us a rate to move the gypsum from Peace Point to both Edmonton and Calgary.

THE CHAIRMAN: They have given that to you?

MR. GRIMBLE: This is in the order of to Edmonton, 40 cents a hundredweight, which is \$8 a ton. The cement plants are paying on the order of \$12 a ton.

MR. BISHOP: Should I read these letters into the record?

THE CHAIRMAN: Yes, please.

MR. BISHOP: The first letter is dated October 5th, from Mr. W. A. Dunbar, Division Freight Agent of the Canadian National Railways, to Mr. Grimbale, and it reads as follows:

"Confirming telephone conversation date, and your verbal request to Mr. C. A. Wood, General Freight Agent, C.N. Rlys., Winnipeg, for carload rate on gypsum rock from Peace Point via Waterways, Alberta to Calgary.

"I have been authorized by Mr. Wood to quote rate of 48 cents per 100 pounds, subject to minimum weight of 80,000 pounds when loaded



in cars with marked capacity less than 100,000 pounds, and minimum weight 100,000 pounds when loaded in cars with marked capacity 100,000 pounds or higher, on gypsum rock from Peace Point to Calgary, Alberta.

"I have advised Mr. Wood you also desire the rate from Peace Point to Edmonton, which rate will be given to you when received from Mr. Wood."

Then there is a letter dated October 7th also from Mr. Dunbar, and this letter reads:

"This will confirm telephone conversation date, at which time I quoted you rate of 41 cents per 100 pounds on gypsum rock from Peace Point to Edmonton, Alberta; which rate is subject to minimum weight as outlined my letter October 5th."

THE CHAIRMAN: What is the date of those letters?

MR. BISHOP: The first letter is October 5th and the second letter is October 7th.

COMMISSIONER GAINER: Forty-one cents and 48 cents?

THE CHAIRMAN: \$9.60 a ton to Calgary and \$8.20 to Edmonton. What is the price of gypsum now in Edmonton?

MR. GRIMBLE: I would have to check on that. The last time I checked it with Inland Cement I think they said \$12.50 a ton was what they were



paying, but I will have to check that.

THE CHAIRMAN: And the price of gypsum in Calgary?

MR. GRIMBLE: I do not know.

MR. SOUTHWORTH: That includes also the cost of gypsum, not just the transportation. We have not quoted any cost but one set of figures here is the rate per ton from Peace Point and the other is the rate of moving it from Windermere or Gypsumville plus the cost of gypsum.

MR. FEEHAN: May I enter these as exhibits?

MR. GUEST: Mr. Chairman, can we give the competitive picture as far as freight rates are concerned now?

THE CHAIRMAN: Let us make sure Mr. Grimble has dealt with gypsum himself.

MR. FEEHAN: The letter from Mr. Jordon dated October 13th will be Exhibit 52-YY.

---EXHIBIT NO. 52-YY: Letter dated October 13th from J. B. Jordon.

MR. FEEHAN: The two letters from Mr. Dunbar dated October 5th and October 7th will be Exhibit 52-ZZ.

---EXHIBIT NO. 52-ZZ: Letter dated October 5th to Grimble from Dunbar of CNR. Also letter dated October 5th to Grimble from Dunbar of CNR



THE CHAIRMAN: Anything else on gypsum?

MR. GRIMBLE: Yes. I think I might bring forward the information Mr. Guest volunteered, and that is the competitive picture in regard to freight rates to both Edmonton and Calgary from the present sources of supply. Dealing with Manitoba, Calgary now gets its supply from Amarinth and Gypsumville, Manitoba, and from Amarinth to Calgary is 44 cents a hundred-weight. From Gypsumville to Calgary it is 50 cents per hundredweight, which is better than the 48 cents that is quoted from Peace Point. There is the picture. Windermere to Calgary is 25 cents and I have not got the rate to Edmonton.

MR. GUEST: The rate to Edmonton is 35 cents from Windermere.

MR. GRIMBLE: Windermere is 35 cents and I have not got the rate from Gypsumville to Edmonton.

MR. GUEST: It is the same from Calgary, 51 and 44.

MR. GRIMBLE: I think the Inland Cement Company are getting their supplies from Manitoba at the 51-cent rate.

THE CHAIRMAN: What about mining costs in the different places, at Peace Point and at Windermere?

MR. GRIMBLE: I can only go on the basis of what Mr. Jordon told me, and they were quite interested



in developing Peace Point. Both Mr. Jordons have had considerable experience in quarrying gypsum, and from this I would infer that the mining and quarrying of gypsum at Peace Point is not a difficult problem, any more difficult that it is at Windermere or Gypsumville.

THE CHAIRMAN: Do you feel it would be about the same or do you feel it could be easier?

MR. GRIMBLE: I did not ask them the specific question, but the fact of the confidential telegram and Mr. Jordon was quite enthusiastic about gypsum at Peace Point, I consider that there would be no problem quarrying it.

THE CHAIRMAN: Is that all you have to say about gypsum now, Mr. Grimble?

MR. GRIMBLE: Yes, sir. There is another matter which relates to the gypsum somewhat, which I might bring in at this time. I do not know how pertinent this is, but we discussed with Mr. Oeming, the Director of the Alberta Game Farm, as to operations of mining gypsum in the Park, whether it would be serious as far as the the game preserve aspect was concerned, and he wrote us a letter in which he outlined his thinking. This is a letter to myself, dated September 26th, 1959:

"I wish to confirm with you our recent telephone conversation wherein you asked my opinion on the matter of projecting further to the north the now existing southern border



limit of Wood Buffalo National Park.

"If this were done it would allow 'out of park' exploitation of the gypsum deposits along the Peace River and more of the splendid spruce stands along that same river and many other mineral discovery activities.

"It is my opinion, when one considers the vast extent of that park, that this northward projection of the park boundary would not significantly interfere with the functions of the park. The bison, I am sure, would in no way be jeopardized and with a vast park area still remaining and containing such world uniqueness as Whooping Cranes, there would be ample room and security for the many interesting mammals and birds found there. However, some thought ought to be directed towards making every effort possible in Northern Alberta to preserve and perpetuate the vanishing Woodland Caribou.

"Please advise if further comment is required. The topic is huge."

I think he was getting in a lick for the Woodland Caribou which is not part of the problem.

MR. FEEHAN: Shall we make this 52-AAA?

THE CHAIRMAN: Very well.

MR. FEEHAN: That is a letter from Mr.

Oeming dated September 26th, 1959.



ANGUS, STONEHOUSE & CO. LTD.
TORONTO, ONTARIO

2250

---EXHIBIT NO. 52-AAA:

Letter dated September
26, 1959, to Grimble
from Oeming.



THE CHAIRMAN: Have you anything further to say on gypsum?

MR. GRIMBLE: No, sir.

THE CHAIRMAN: Any other questions?

COMMISSIONER GAINER: There is one question I would like to raise, Mr. Grimble. Do you know why the Calgary interests are drawing their supplies from Manitoba in a greater extent? Is the Windermere not available?

MR. GRIMBLE: I don't know. Mr. Guest may tell us. I think the pit at Windermere is owned by Western Gypsum. The other supplier in Calgary has to draw from Manitoba.

MR. SOUTHWORTH: Yes. Usually the users of the gypsum have a big interest in the deposits, and the freight rate differential is not too material. They will hold up a quarry for themselves and not use it, but the purpose of holding up the quarry is so that competition may not get a hold of it. The Industrial Development Bank tell us that they are almost plagued with applications for loans to develop gypsum deposits. One I am very familiar with is in Kamloops, British Columbia, and the Industrial Development Bank is always getting applications to open up these deposits. They don't look favourably on these applications when these big companies are so much in it, and they are consumers and they are certainly not going to buy when they own their own



supplies.

THE CHAIRMAN: Do you have something to say about gypsum, Mr. Guest?

MR. GUEST: I just wanted to place the competitive picture, but Mr. Grimble has done it, and that is all I would say, as far as the freight rates are concerned.

THE CHAIRMAN: Mr. Southworth, do you think that this gypsum deposit at Peace Point is not a feasible thing?

MR. SOUTHWORTH: Well, the feasibility is related to having a market of some size, and we didn't put forth in our brief that the deposit wouldn't be used. We put forth information that we received from what we considered responsible parties, the Western Gypsum, the Industrial Bank and the Alberta Research Council. Dr. Grace was approached by ourselves, and he said that the gypsum was of high quality and easy to mine. If that was purchased by the big user of gypsum, that would be the position.

THE CHAIRMAN: There are two deposits, one at Windermere and one in Manitoba.

MR. SOUTHWORTH: The Manitoba deposit, as I understand it, is very easy to mine and it is in the centre of a very large market; in other words, they mine very large tonnages each year. Windermere isn't on the same scale, as I understand it, but they are close enough to markets to warrant an



economic operation. The Brule deposit is within Jasper National Park and there is interest in opening up that deposit; but this has folded somewhat, according to Dr. Grace, and would be a little harder to mine. The one at Kamloops is close to the tracks and it could be put right into the car.

COMMISSIONER GAINER: Do you know what shipments they are making at the moment at Kamloops?

MR. SOUTHWORTH: I inquired; I wasn't given any answers. They preferred not to unless it became a major point. You may say the information is confidential.

COMMISSIONER GAINER: They didn't give you figures, but you have suggested that the scale of the quarry operation might be critical.

MR. SOUTHWORTH: Well, as I understand it, this is the critical thing.

COMMISSIONER GAINER: Have you any information that they are operating on a large-scale basis, from your observation at Windermere?

MR. SOUTHWORTH: They supply a great deal of gypsum to Calgary, to Edmonton - well, the Edmonton market is reasonably limited; plasterboard is the big consumer.

COMMISSIONER GAINER: Windermere is definitely in the Vancouver market in a sizeable way.

MR. SOUTHWORTH: It is sizeable. What proportion they have I do not know, but they have had



this operation for some years and are certainly continuing it. There are matters which a layman like myself is not familiar with and I couldn't say whether they will change or not.

COMMISSIONER GAINER: I suppose you don't have figures on the scale of their operation in Manitoba.

MR. SOUTHWORTH: I know it is in the order of hundreds of thousands of tons. But it is a very large market; one of the biggest industrial complexes in the world is within a few miles - the whole Great Lakes system. Gypsumville, Manitoba, is one of the biggest markets, I believe.

THE CHAIRMAN: Are you familiar with the way in which gypsum is quarried, Mr. Grimble?

MR. GRIMBLE: No, I am not.

THE CHAIRMAN: Do you know, Mr. Southworth?

MR. SOUTHWORTH: I have seen the quarry at Windermere.

THE CHAIRMAN: Would it mean the employment of many people if a quarry were opened at Peace Point?

MR. SOUTHWORTH: It is not a large scale employer. They knock rocks out of the deposit of a certain size and they try to keep this size so it can be handled easily by a man, and they don't produce too many finds which are usable. They are put on flat cars or gondola cars. In the case of the Mexican



gypsum, they arrive in ships in a size of rock that can be handled by one man; they arrive in about 40-pound chunks. In the operation I saw them use the euclids, and transferred it to the car. I don't think there is very big employment in the town of Windermere, although it is a big deposit. Most of the people there are employed in the tourist business.

THE CHAIRMAN: Has any attempt been made to have the gypsum shipped up by water, Mr. Grimble?

MR. GRIMBLE: Yes. Mr. Jordan made a very intensive study of that, and the information he gave us was as a result of this study several years ago. It was before the railway was active.

THE CHAIRMAN: He thought it was a practical end?

MR. GRIMBLE: Yes, he thought there was a possibility, that it was a possibility then.

THE CHAIRMAN: Have you got a copy of the report he wrote years ago?

MR. GRIMBLE: No. Mr. Jordan, Senior went to England before I was able to contact him and I wasn't able to get his files, but Mr. Jordan, Junior was familiar with it and was able to give me this from memory.

THE CHAIRMAN: Any other questions on gypsum?

MR. GRIMBLE: There is one further matter regarding gypsum the Commission may be interested



in, and this is from the recent publication of industrial minerals in Alberta, and they deal fairly extensively with the Peace Point gypsum deposits. What I will read are the conclusions. It is page 53. It is Preliminary Report 58-2 of the Geological Division:

"The gypsum deposit at Peace Point is undoubtedly the most suitable for development in Alberta. Present known reserves are very large and the purity compares favourably with other commercial deposits (which range from 95 to 97 per cent gypsum). The thin overburden should permit ready removal of the gypsum by quarrying and, should the proposed railway from McMurray to Great Slave Lake be built, shipments to marketing centres will be an economic possibility. Because the gypsum lies within Wood Buffalo National Park, revised federal legislation giving adequate protection to the indigenous fauna would be necessary before development could proceed".

MR. BALDWIN: The only thing I would like to ask is if Mr. Grimble or Mr. Bishop have anything more authoritative than Mr. Oeming's letter regarding the possibility of government - and I say government as distinct from departmental officials - being prepared to move the boundary of the park or change the status of the park. I mention it now rather than dealing with it later.

THE CHAIRMAN: Isn't that in the jurisdic-



tion of the Parliament of Canada?

MR. BALDWIN: Yes. I was asking if Mr. Grimble had anything to indicate authoritatively if that was proposed, other than the pious wish expressed in the letter of Mr. Oeming.

THE CHAIRMAN: Do you know anything about it, Mr. Baldwin?

MR. BALDWIN: No. I probably might be the last one to know about it. But there is a whole paragraph and a half devoted to that suggestion, and I think the whole question of gypsum depends on it. I was asking if there was anything other than Mr. Oeming's letter.

MR. BISHOP: Mr. Chairman, we don't have anything authoritative at all on this point. As Mr. Baldwin has stated so correctly, it is a matter for the legislature, and, as Mr. Baldwin also made clear some weeks ago, it was his personal opinion as a member of the legislature at the moment that no change should be made to either the boundaries or the rules concerning Wood Buffalo National Park. On the other hand, we certainly submit it must be apparent that Wood Buffalo Park is not the same type of park in any sense as the other national parks of Canada, that by both its size and location it is much more in the nature of a game reserve. We would also like to point out that, in the past, when occasions have arisen to change the rules relating to national parks



for specific purposes - I am thinking of the necessity of getting certain easements to put the Trans-Canada Pipelines through Jasper Park - necessary changes were made; the rules relating to national parks are not immutable laws - although as a part-time resident of Jasper we sometimes get that feeling, perhaps.

THE CHAIRMAN: It is a matter for the Parliament of Canada. It seems to me that the matter could be left on that basis.

MR. BISHOP: We are quite happy to leave it at that.

THE CHAIRMAN: What do you think, Mr. Baldwin?

MR. BALDWIN: Yes, perfectly all right. I just wanted to know so that I wouldn't have to deal with it later. The reference was made in the brief, and I just asked Mr. Grimble whether there was anything else or whether that letter constituted the material.

THE CHAIRMAN: There has been a good deal of discussion about the timber and gypsum in Wood Buffalo Park, and a lot of that hinges on what the present status is. I think we will have to deal with that in our brief. Anything that might be done in the park - in fact, anything that might be done anywhere north is subject entirely to the Parliament of Canada, isn't it?

MR. BISHOP: Mr. Grimble has little more to say about gypsum.



MR. GRIMBLE: This didn't appear in our brief because we tried to confine our attention strictly to the terms of reference for the development of the District of Mackenzie. But I would like to point out, briefly, that the potential of material, although it is a southern terminus - it has salt, it has salt operations there; silica sand from the tar sands development; they have deposits of refractory clay suitable for brick-making; limestone is there in abundance, and there is a good source of gravel for construction. If the tar sands were a success, there would be a supply of sulphur and coke, petroleum fuels. There is presently a lumbering industry; there are plywood peeler logs not far north of McMurray.

THE CHAIRMAN: There is no lumber industry there now, is there?

MR. GRIMBLE: Yes, there is lumbering industry in McMurray, in the vicinity of McMurray. I am speaking now in terms of the vicinity of McMurray. I have the car load shipments from that area if you are interested in the lumbering that is going on there now.

THE CHAIRMAN: Would you give me those items again?

MR. GRIMBLE: I mentioned first salt; there is the possibility of silica sand, sulphur and coke and fuel, petroleum fuels from the tar sands, should this pilot plant be a success; there



is refractory clay which is suitable for brick-making and pottery, etc.; there is limestone suitable for a cement plant; there is a plentiful supply of gravel for building operations. There have been discoveries of natural gas not far south of McMurray. There is a lumbering industry now in the McMurray area and south of McMurray; there is a good source of plywood peeler logs, starting at a point about 25 miles north of McMurray and extending down about 100 miles. There is an adequate source of water for any industry that would want to establish there.

THE CHAIRMAN: You said there is a good supply of plywood peeler logs there. The evidence we had was that it was only down for 20 miles. It is easy to slide over anything like this glibly. The situation is this, that we have the evidence of Mr. Rueger that there are peeler logs starting 25 miles down the river and running 35 miles down the river, plus a rumour that there are more further down the river.

MR. GRIMBLE: He said that their timber cruiser was very familiar with this area and that there were peeler logs all the way down to the Delta. He said personally he had only been down to Fort McKay, but his cruiser operated in this area for many years. I talked to the cruiser myself.

THE CHAIRMAN: You know that yourself?

MR. GRIMBLE: Yes. I know he operated



a sawmill in the Delta for many years, this particular cruiser, and Mr. Rueger said that he had personally only been as far as Fort McKay, but their timber cruiser was very familiar with the area, and also the forest ranger at Fort McKay is very familiar with this territory and he said the same thing. We have the coloured maps which show the type of growth, and this definitely indicates that ~~there~~ is a good supply all the way down. I am glad you brought this up, if you are under some

- - .



THE CHAIRMAN: There is this difficulty we are running into in the kind of evidence coming before this Commission. Somebody comes in and says so-and-so is a fact, and in several instances what he has said are things he knows to be a fact or he has reasonable authority for saying it is in a fact, but in many cases when we really come to it he has got it from somebody who thinks it is so. In this case I was just wondering.

MR. GRIMBLE: I am glad you brought this up. I am personally aware of this, and also Mr. Denney was aware of this, and he said here that he was familiar with the whole area along Lake Athabasca and he confirmed there is a good stand of logs there. I mentioned water: there is an adequate source of water, both the Athabasca and the Clearwater. I know there is a good source of water power in the Athabasca in the Grand Rapids not far from McMurray.

THE CHAIRMAN: How far are those rapids?

MR. GRIMBLE: They start at the bend in the river at this point here, and these rapids are all named here -- Grand Rapids, Prairie Rapids and many other locations marked as rapids without names.

THE CHAIRMAN: Within sixty miles, is it?

MR. GRIMBLE: I think this would be about forty miles.

THE CHAIRMAN: Forty miles and closer?

MR. GRIMBLE: Yes, starting at forty miles,



and, of course, the potential is there for 1,600,000 horsepower in these rapids, using Lesser Slave Lake as a reservoir. I dealt with water power. They have found gypsum at McMurray, which is in this same publication, but, of course, it is not as accessible as the gypsum at Peace Point, and it is only referred to as being there. It is 700 feet down.

Then the last item is the potential iron ore deposits east of Waterways on the Saskatchewan side of the border, in this general area. I think Mr. Edgar mentioned the main location. I have not attempted to review this completely, but these are things I wanted to mention.

THE CHAIRMAN: I will go over them. The salt was mined?

MR. GRIMBLE: From 1950.

THE CHAIRMAN: It is not being mined now?

MR. GRIMBLE: When the Lindberg salt mines started up these people had to close down because they were not competitive.

THE CHAIRMAN: But the salt is still there?

MR. GRIMBLE: Yes.

THE CHAIRMAN: And it is readily accessible?

MR. GRIMBLE: It is a drilling proposition. It is transportation from Waterways down that makes it not competitive.

THE CHAIRMAN: But that is south of the Clearwater River and east of the Athabasca?



MR. GRIMBLE: Yes, right in the McMurray townsite.

THE CHAIRMAN: What about this refractory clay?

MR. GRIMBLE: I think that is in the Athabasca River not far from McMurray.

THE CHAIRMAN: Is it accessible now, or would you have to build a bridge across the river to get at it?

MR. GRIMBLE: I do not know.

THE CHAIRMAN: You mentioned silica sand, sulphur and coke. Are you referring to those as they would be produced from the plant at ---

MR. GRIMBLE: Yes, it is.

THE CHAIRMAN: Is there not some silica sand close to McMurray? It seems to me when we were up there someone pointed out some of it to us.

MR. GRIMBLE: I think the bituminous sands close to McMurray -- as a matter of fact, one of the tests was taken from a plant near McMurray, and this would require purification, but if it was not a product from the tar sands part of this development, it is doubtful whether they would open them up.

THE CHAIRMAN: Where was the Abasand plant? Was that south of McMurray?

MR. GRIMBLE: Yes, a short distance south.

THE CHAIRMAN: And east of the Athabasca river?



MR. GRIMBLE: Yes.

THE CHAIRMAN: That does not need a railway?

MR. GRIMBLE: It burned down; it is not there any more.

THE CHAIRMAN: The limestone for cement, where is that?

MR. GRIMBLE: It extends north along the Athabasca river a good many miles.

THE CHAIRMAN: Which side?

MR. GRIMBLE: Both sides. It is north of the Clearwater. You would have to cross the Clearwater or the Athabasca.

THE CHAIRMAN: You say there is good gravel?

MR. GRIMBLE: Right in McMurray.

THE CHAIRMAN: Now, what about lumber? Is there any lumbering going on north of the Clearwater?

MR. GRIMBLE: There is some just north and east of McMurray, a matter of five or six miles. I do not know of any in the Clearwater. I am not personally familiar with any at the Clearwater.

THE CHAIRMAN: That would be north of the Clearwater?

MR. GRIMBLE: Or up the Clearwater.

THE CHAIRMAN: How would you go across the Clearwater?

MR. GRIMBLE: It is a winter operation.

THE CHAIRMAN: What about a ferry; is that feasible for lumbering?



MR. GRIBLE: They have operated ferries at Whitecourt, for example, just for the lumbering industry. The Whitecourt Lumber Company had a ferry across the Athabasca for a good many years.

THE CHAIRMAN: But most of the lumber now is south of McMurray?

MR. GRIMBLE: Yes.

THE CHAIRMAN: I just bring this up because of the Peace River being the southern terminus at which there is a lot of potential as well.

COMMISSIONER THOMSON: In this salt, limestone, refractory clays, whether you build the railway east or west does not affect them in the least. You cannot operate them at a profit even with the railway there right now. Is that the idea? I mean, why bring them up? The salt has been in operation twice -- the salt mine?

MR. GRIMBLE: I do not know.

COMMISSIONER THOMSON: Well, at least once?

MR. GRIMBLE: Yes.

COMMISSIONER THOMSON: What about the limestone? Have they tried doing anything with it?

MR. GRIMBLE: No, there is not a market right now.

COMMISSIONER THOMSON: And the refractory clay?

MR. GRIMBLE: No.

COMMISSIONER THOMSON: You say it was a



transportation problem; in other words, they can get salt easier and cheaper than they can from there?

MR. GRIMBLE: The Lindberg operation is closer. I bring this up not as a contributing factor to the railway other than it is to the southern terminus and the industry in McMurray is potential. It has a lot of promise. I am not trying to say these are going to contribute to the railway in the north in the way of freight other than to say McMurray has a lot of promise and if encouragement is given to McMurray to develop it has a tremendous potential.

THE CHAIRMAN: That is the same kind of argument that was advanced to us by Dr. Riley.

MR. GRIMBLE: Yes, it is exactly the same argument.

THE CHAIRMAN: And by the Yukon Chamber of Mines.

MR. GRIMBLE: Yes.

THE CHAIRMAN: Industrial development is a good thing and each little bit encourages other bits.

MR. GRIMBLE: Yes, exactly the same sort of thing.

COMMISSIONER GAINER: This report on industrial minerals, that is an Alberta Research Council report?

MR. GRIMBLE: Yes, in 1958, Research Council Report No. 2.

THE CHAIRMAN: Anything else now on this



section of mining?

MR. BISHOP: Mr. Chairman, Mr. Grimble has some information he would like to put in as exhibits. These have been raised before but now they are available for us concerning the forest management units.

MR. GRIMBLE: I did not have an opportunity to get together with Mr. Fouks before he left regarding the actual cuts over the last two years in the Peace River management units. We would like to make this available to you for future reference. We would like to give you these publications from the Alberta Forestry Department which give the actual cuts in all the Peace River management units from 1955 right up to this date, if you are interested in having them. This may clarify any questions that may arise during your discussions regarding cuts in these years.

THE CHAIRMAN: Do you think we will understand them without someone to answer questions?

MR. SOUTHWORTH: Mr. Chairman, all the cuts are not in management units. As I understand it, some of the cuts around the Cape River are not in management units.

MR. GRIMBLE: They are classified as P-0 and anything not in the Peace River forest district that is not in a management unit is classified under P-0.

THE CHAIRMAN: What years were these for?

MR. GRIMBLE: 1955 to 1959 -- 1955-56 and



1958-59.

THE CHAIRMAN: Exhibit 52-BBB.

---EXHIBIT NO. 52-BBB: Publication showing actual cuts in Peace River Management Units.

THE CHAIRMAN: Perhaps Mr. Southworth should have a copy?

MR. SOUTHWORTH: We went over this several times and we still think our figures are valid, subject to checking with the Forestry Department at any time.

THE CHAIRMAN: Could you give us a summary of these exhibits, Mr. Grimble?

MR. GRIMBLE: This last one?

THE CHAIRMAN: Yes.

MR. GRIMBLE: The summary that you have is on an exhibit we put in on forestry, which summarizes the actual cuts in the management units which were pertinent. This was summarized and typed into the bottom of one of the earlier exhibits.

THE CHAIRMAN: Well, we are interested in how much total freight there might be or how much industrial development might be encouraged by the railway, and if you could give us your interpretation of all these figures in a short form it would certainly help us and give Mr. Southworth an opportunity of pointing out where he agrees, if he does anywhere.

MR. GRIMBLE: It is already given in the exhibit that covers forestry. What we did at the



bottom of that page was summarize these pages.

THE CHAIRMAN: Would you mind during the noon adjournment just checking, because I would like to make a note as to which exhibit it is.

MR. GRIMBLE: It is 52-Z, "Carloadings on NAR of lumber from western route," and at the bottom of that particular page, 52-Z, we summarize the actual cuts in the forestry management units that would contribute to the traffic on the railroad.

COMMISSIONER THOMSON: In 52-Z you do not take into account the tonnages shipped north to Hay River?

MR. GRIMBLE: No. The total gives to P-O that which is cut north of the management units, and anything that would be north would probably come from that particular cut.

COMMISSIONER THOMSON: But it would not show on the carload to Grimshaw?

MR. GRIMBLE: No, but it shows as being the actual cut, and it is one reason for the 12 million cut and the 19 million; that is one of the differences.

THE CHAIRMAN: You have finished your brief now down to the bottom of page 43?

MR. BISHOP: I think we have, my lord.

THE CHAIRMAN: Very well, we will adjourn until two o'clock and at two o'clock Mr. Guest has some evidence he would like to give us.



MR. GUEST: Yes.

THE CHAIRMAN: Would you mind during the noon adjournment looking through the last part of the City of Edmonton Chamber of Commerce? I do not think there is anything on the rates that Mr. Guest would be interested in, but perhaps you might like to comment on something.

MR. GUEST: Very well.

THE CHAIRMAN: We will adjourn now until two o'clock.

---Luncheon adjournment.



---On resuming at 2.00 p.m.

THE CHAIRMAN: Mr. Guest, you were going to finish your representation this afternoon.

MR. GUEST: Thank you.

Mr. Chairman, my name is Guest and I am a transportation economist for the Government of British Columbia. I graduated from the University of Saskatchewan and have worked for the Government of British Columbia for the past five years in the capacity I have mentioned. Most of my work deals with rail transportation and various problems which British Columbia shippers have to face. This afternoon I just want to make a few observations on the transportation aspect of the Terms of Reference of the Royal Commission.

About a year ago in Edmonton the Minister of Northern Affairs delivered an address to a Northern Development conference, and I would just like to quote a paragraph from his address. He says:

"Since economic expansion depends in such a large measure upon the rate at which mineral exploration progresses, we are eager to help in hastening the process.

"The chief problem, and in many ways the only important one, is transportation. The limited transportation facilities in the



Territories today leaves almost their whole area inaccessible to economic development. Where these facilities do exist, the distance from markets and sources of supply and the small unbalanced volume of traffic make transportation the largest single cost item in mining and other industrial operations. Transportation is the main reason why the Territorial economy is a high cost economy. Reducing the problem it presents is the great key to future development."

I think the Honourable Mr. Hamilton views the situation correctly. When we are looking at the proposed railway I think we should endeavour to ascertain what savings can be assured the people of the Northwest Territories in so far as transportation costs are concerned. Obviously this is of great importance.

I think most of our discussion to date has been confined to the merits or demerits of the intervening territory involving traffic of the railways, and so on. We have not spent too much time, in my experience at the hearings, with the actual Territories, with the savings that might accrue to the people of the Northwest Territories, which will assist them in developing the country, and, of course, developing traffic for any railway line which goes into the Territories.

This, of course, involves the problem of



railway freight costs, of freight prices, and because of some of the discussion we have had I would like to discuss this particular problem very briefly.

It has been intimated rather generally that railways through the goodness of their heart will endeavour to haul commodities as cheaply as they possibly can even if they just make one-tenth of one cent a ton-mile. They will haul the commodity as long as they make some contribution to overhead or even if they just cover their operating costs.

Now, this is not the basis for freight pricing, and I want to quote the General Counsel of the Canadian Pacific Railway, Mr. Ian Sinclair. I am quoting from page 101 of Volume 1, of the Royal Commission on Transportation, our other Royal Commission in Canada. Mr. Sinclair stated as follows:

"The position of the Canadian Pacific Railway Company is that the freight rate structure, which is based on the value-of-service principle, is a valid way of making rates; that the value-of-service principle has been circumvented to the degree that the impact of competition has reduced its range, and that the erosion and attrition is a fact but it results in the fact that some of the higher rated so-called commodities are not able to make as great a contribution to total railway expenses as they used to make



before the advent of competition throughout Canada, and as a result of that there is some attrition and some erosion."

Now, the value-of-service principle in pricing rates is simply the railways charge what the customer is willing to pay, or able to pay. It is usually referred to as "they charge what the traffic will bear." Consequently, if there is no competitive factor the railways will charge what the traffic will bear up to the maximum which is laid down by the Board of Transport Commissioners in the Class rates. Therefore, if we are going to get cheap transportation, and that is to pay less than the maximum, we have to find some factor in the situation which will lead the railways, or compel the railways, to reduce their rates.

The most obvious and most effective method of doing this, of course, is to have some competition in the field. Competition, as any traffic man knows, and as Mr. Sinclair has pointed out, is the basis for most rate reductions.

It is our contention, Mr. Chairman, that there will be a more competitive situation if the railroad is built on the western -- via the proposed western route than if it is built at the proposed eastern route.

At the present time we, of course, have a highway from Grimshaw to Hay River and it is a non-



competitive operation. On the eastern route we have rail barge, also non-competitive. If the railway is built on the eastern route to Fort Smith and up to Pine Point, and there is a combination -- a barge-rail combination -- it will still be non-competitive, although there will be some reduction in rates from Fort Smith north. The rate will be lower, will conceivably be lower from Fort Smith, if the railway is built, than they are at the present time, to such places as Yellowknife.

I am going to enter an exhibit at this time, which I will discuss a bit later.

THE CHAIRMAN: Did you say if a railway is built from Fort Smith the rates from Fort Smith on will be lower than they are now?

MR. GUEST: To a point, yes, they will be.

THE CHAIRMAN: What about the rates from here to Fort Smith?

MR. GUEST: There are no rates to Fort Smith now; the rate is to Waterways. The rail rate plus the barge rate from Edmonton to Yellowknife will be lower if the rail goes to Fort Smith than it is at the railhead at Waterways. In other words, the costs of moving by water will be reduced considerably, considerably more than the increase in the rail rate from Edmonton to Fort Smith over the present road from Edmonton to Waterways.

THE CHAIRMAN: I am afraid I do not follow



that.

MR. GUEST: Well, I have it in this exhibit and I have given a copy to Mr. Gordon yesterday so he can check it. The point is that the present situation is largely non-competitive. There are small competitive factors but it is a non-competitive situation from the point of view of transportation.

Now, if the railway is built on the western route we will have all-year-round competition on the highway between railway and truck, and, of course, truck is the most vigorous competitor that the railways have.

In the exhibit which I have filed on the basis of estimated mileage, because I am not sure of the mileages and Mr. Gordon and I had some argument about one of the mileages, but on the basis of estimated mileages we have the present rate, the rail and barge rate to Fort Norman, of \$2.42 for the type of freight mentioned, Class 45 and barge Class 5. Via highway and barge we have a total rate now of \$3.68 and the winter road, of course, is \$1 extra, making it \$4.68. The barge rates are based on the rates of the Northern Transportation Company, and there are some differences between the Yellowknife and Northern at one or two points.



Now, if the railway is built via Fort Smith, you get a rate of \$2.66, as against the present rate of \$2.82. This is a reduction of 14 cents a hundred, \$3.20 a ton. Now, if the railway is built via Grimshaw, Hay River - and I have the mileage here of 710, and as long as the mileage doesn't go over 725 the rates won't change; if it is more than that it will be higher. But assuming it is in the range of 725 miles, the new rate to Yellowknife would be \$2.61, as against \$2.66 from Fort Smith and against the present rate of \$2.82 and the present truck-barge rate of \$3.68.

Now, as I said, the present highway and barge rate is \$3.68, and if the railway is built to Hay River, the western route, the trucks must meet the rail competitive rate. Now, the class rate is \$1.88, class 45; the truck rate is \$2.58 for class 4, truck-load lots, and I am assuming that the trucks will meet the rail rate. I am assuming they will meet it, because if they don't meet it within reason, whatever value the customer places on having the material delivered to his door, then they are going to lose the business to the railway. This gives us a rate of \$2.96, which would be a competitive rate; the trucks would be competing with the rail.

Now, the rail and barge rate via Hay River, Grimshaw, Hay River, is \$2.61, and I estimate that the truck and barge rate would be \$2.96; the additional 35 cents I assume would apply as it does now in regard



to handling, because if you ship rail and barge, the handling is absorbed. But, according to the information we have received, they charge 35 cents now from Hay River to Yellowknife. So we get a reduction in the rate, 72 cents, approximately \$14.00 a ton, and that is a reduction of \$14.00 a ton on the tonnage which is now trucked, by barge, or in the wintertime trucked around the lake. The winter rate would, of course, go down accordingly; it would be a 70 cent saving, according to my assumption and my estimates of mileage and rates.

Now, this would result in a very substantial saving, and I think this is one of the factors that the Commission has got to weight very carefully when they are making recommendations.

Now, on page 2 - -

THE CHAIRMAN: Before you leave that, Mr. Guest, I am not sure I understand how you have calculated the railway rate. Is that on the basis of the schedule we had the other day?

MR. GUEST: Class 45, yes.

THE CHAIRMAN: And a certain increment for every so many miles.

MR. GUEST: Well, it varies, but this is based on the class 45 scale rates. As the mileage increases, so the rate increases.

COMMISSIONER GAINER: But it is tapered beyond Waterways.



MR. GUEST: There is a taper, of course, in the rate, but as far as the shipper is concerned, he has got a rate to pay in Yellowknife.

COMMISSIONER GAINER: How did you come by a product mix? You have used class 45. That is the only type of freight you are talking about, in your example.

MR. GUEST: Yes, class 45, because we were using class 45 as a representative classification of general merchandise; this doesn't apply to general commodities. I use class 45 because that is what we have been using from time to time as an example.

Now, on page 2 - -

THE CHAIRMAN: Mr. Guest, I would like to say this: you are assuming that this railway, when built, will be treated in exactly the same way as old-established lines are treated.

MR. GUEST: Yes.

THE CHAIRMAN: Do you know whether or not that is a regular thing when a new railway is built of this type?

MR. GUEST: Well, I think so, yes. If the railway is part of our national system, as I think it is, any rates have got to be approved by the Board of Transport Commissioners, and they will not be allowed to charge any more than the maximum rates, and we are quoting the maximum rates here.

THE CHAIRMAN: Unless the Transport



Commissioners change their rulings.

MR. GUEST: Unless the Royal Commission and the Government tell them that this is an exception, they could charge more.

THE CHAIRMAN: When the railway was built to Hudson Bay, do you know what happened there?

MR. GUEST: No, I don't.

THE CHAIRMAN: We have an exhibit which was filed here showing us just what happens to the rates when they go up. Certainly it would mean this, the scale you have provided for would mean this, that freight going from Edmonton to Waterways would travel at so many cents a hundred pounds; around 7 cents, I think it was.

MR. GUEST: You are talking about per ton mile?

THE CHAIRMAN: Yes.

MR. GUEST: Yes.

THE CHAIRMAN: And then it would taper.

MR. GUEST: The rate per ton mile declines the further you go.

THE CHAIRMAN: Assuming that the 7 cents a ton mile just pays the operating costs, 3 cents a mile would not appear to be enough to pay the operating costs from Waterways up to Fort Smith.

MR. GUEST: The railways wouldn't have any financial problems, when you figure their national average is 1.5 per ton mile, and we haul grain for



5.9, and that the rate that was referred to on gypsum of, say, 41 cents to Edmonton - the railways gave a rate of 41 cents to Edmonton, which, roughly, would be 1.45 cents a ton mile - they are going to make money on that, because they are not allowed to quote a rate unless it is compensated. When they reduce a rate, for example, on the basis of truck competition, the Board insists that this rate must make some contribution to overhead, and they are not allowed to quote rates below out-of-pocket costs; in fact, they have to make something more than out-of-pocket costs.

THE CHAIRMAN: Another important factor is whether the railway will make money or there is a subsidy.

MR. GUEST: Yes. We expect a railway like this is not going to make money for some time, because a railway has to develop the country, and in developing the country it will develop the traffic.

THE CHAIRMAN: You calculate this, that the railway via Fort Smith would mean a rate to Yellowknife of 2.66 cents. Am I right in assuming this, that the rate would go by rail to Fort Smith and by water from there to Yellowknife?

MR. GUEST: Yes, I am assuming that.

THE CHAIRMAN: And via Grimshaw it would go by rail to Hay River.

MR. GUEST: Yes.

THE CHAIRMAN: And then by water from then



on, and you are assuming there the spur line going on up.

MR. GUEST: Yes.

THE CHAIRMAN: And then you have winter rates, and you say if it goes along the west route - I am sorry, take the east route first, consider that first in regard to the summer rates. That is \$3.86, isn't it?

MR. GUEST: The east route? Which rate are you referring to? Oh, the highway winter rate via Enterprise - yes, \$3.86.

THE CHAIRMAN: What are you assuming there?

MR. GUEST: The road from Enterprise to Providence - the winter road doesn't travel on that route now; it cuts east of that. I am assuming the same movement they have at the present time.

THE CHAIRMAN: The winter rate if the railway is built along the west route.

MR. GUEST: It would be the winter truck rate, highway and truck rate to Yellowknife. They could truck directly, but the truck rate would be effected by the rail rate. In other words, the current truck rate to Hay River is \$2.58 a hundred, but the class rate, class 45, is only \$1.86.

Now, there is this difference, that the trucks will have to make up all or the majority of them, and then the same thing will be the difference between the two rates, and the customers say: "You don't have to cut your rate because it is worth 10



cents to have it delivered to our door". In this case it is delivered to their door. My statement isn't quite correct. That situation would exist in summertime when you are fishybacking the trucks on the barge across the lake to Yellowknife where there is an additional cost. I am assuming that the trucks will meet the reduction in rate and continue operating.

THE CHAIRMAN: Do you mind if I point out something on the map? We have got the summer situation cleared up, but as far as winter rates are concerned, if the railroad is built along the proposed western route, then one way that the freight would travel in the wintertime is up to Enterprise and then to Yellowknife.

MR. GUEST: Yes.

THE CHAIRMAN: Now, suppose the railroad were built from Waterways, how would you contemplate the freight travelling to Yellowknife?

MR. GUEST: In the wintertime?

THE CHAIRMAN: Yes.

MR. GUEST: It would travel either two ways: (a) Up the highway, as it does now, by truck.

THE CHAIRMAN: If it goes by rail how would it go?

MR. GUEST: Via Pine Point and via highway from Pine Point to Enterprise, and around.



THE CHAIRMAN: You are assuming the rail going only to Pine Point.

MR. GUEST: Yes, I am assuming that if the railway was built on the Eastern route it will end at Pine Point, and if built on the Western route it will end at Pine Point. I make that assumption.

THE CHAIRMAN: If the railroad ends at Pine Point along the eastern route, what will be the freight rate as far as the railway is concerned?

MR. GUEST: The distance to Pine Point, I think, on the eastern route is 715 miles, isn't it? Is that the distance we agreed on, Mr. Grimble? It doesn't make any difference in that figure.

MR. GRIMBLE: 710 miles.

THE CHAIRMAN: \$1.86 - -

MR. GUEST: For class 45 it is \$1.86 to Pine Point.

COMMISSIONER GAINER: It would be the same to Hay River.

MR. GUEST: Yes.

COMMISSIONER GAINER: In your last line here where you were working out a winter rate trucking right through to Yellowknife, Enterprise, you use a \$1.76 figure where I take it you are assuming a competitive truck rate.

MR. GUEST: Yes. They have been put in the one lower bracket.

COMMISSIONER GAINER: So you take off the



10 cents, which is \$1.76.

MR. GUEST: Yes.

COMMISSIONER GAINER: Incidentally, that would be the same if it went by rail to Enterprise and then was trucked through.

MR. GUEST: Yes. The railway might conceivably use their own truck operation.

COMMISSIONER GAINER: And this is assuming that they will meet the rail rate.

MR. GUEST: I assume they will meet it.

THE CHAIRMAN: \$1.86 would be the railway rate to Pine Point, and \$2.10 is the truck rate to Yellowknife.

MR. GUEST: Yes.

THE CHAIRMAN: How much would the truck rate be from Pine Point to Enterprise?

MR. GUEST: Well, the mileage, I think, estimated by Major Charles is 75. Now, let's assume it is between 75 and 100 miles. If there was a ton mile rate quoted of 7.50 a ton, that would be - -

COMMISSIONER GAINER: The figure you have used there of \$2.10 - could you apply that figure to give us a figure from Pine Point to Enterprise?

MR. GUEST: No. I don't know what the mileage would be of the winter road. That is what they charge now. They obviously must make money on it.

THE CHAIRMAN: If our assumptions are



correct, the winter rate would be \$4.33 over the eastern route and \$3.86 over the western route.

MR. GUEST: Something like that.

THE CHAIRMAN: I wonder if Mr. Gordon follows it and if he would tell us if he agrees.

MR. GORDON: I have been following it. I don't think it would be precisely correct. When you are dealing with two winter roads - -

THE CHAIRMAN: If you don't agree, would you mind working out the figures, Mr. Gordon?

MR. GORDON: No. I think there is a little error in it.

MR. FEEHAN: Mr. Guest, have you considered the possibility of trucking from Fort Smith around the east end of the lake?

MR. GUEST: No, I haven't considered it, because - to Yellowknife?

MR. FEEHAN: Yes. I understand that road is now being built.

MR. GUEST: Well, of course, if you have a road - in wintertime the distance may be much shorter. I don't know what the distance is to Yellowknife, but it will be quite a bit shorter than the other route.

MR. FEEHAN: Yes, it would be shorter by a road on the west side; by rail the distance would be shorter on the east route.

MR. GUEST: Yes, that is true. I don't



ANGUS, STONEHOUSE & CO. LTD.
TORONTO, ONTARIO

2288

know the mileages, either on the eastern route - I mean going round the east side of the lake or the west side of the lake. If we had the mileages we may be able to make some sort of general comparison. As long as you have a road, of course, you can truck.



MR. BALDWIN: Is there a road from Fort Smith to Fort Reliance? I thought the only road was from Yellowknife to Fort Reliance, and it was only conjecture on the other. I thought that is what the department officials said, but I do not suppose it is material.

THE CHAIRMAN: It has not been built yet.

MR. BALDWIN: No. I think Dr. Jenness simply said if the railway came.

THE CHAIRMAN: It is one of the roads that has been planned irrespective of whether the railway comes. Is it material at the moment?

MR. BALDWIN: No, I just raised it because Mr. Feehan did, and I thought we had better get the perspective.

THE CHAIRMAN: Do you think it is material, Mr. Feehan?

MR. FEEHAN: Probably not at this point.

THE CHAIRMAN: Very well, we will let it go.

MR. GUEST: Now, on the second page, taking a point and comparing rates, the current rate via Waterways rail and water, \$3.67; highway and barge, the current rate \$4.26. Now, that is the Northern Transportation Company. Yellowknife have a rate of \$1.26 from Yellowknife to Fort Norman, which would make the rate \$3.78, but I am just sticking to the Northern Transportation rates



at this time. I just mention the Yellowknife Transportation for this lower rate into Norman, and it is obvious they have a certain volume of traffic in there.

Now, the future rate via Fort Smith would be \$3.66, which is just about the same as it is now. There would be no reductions through Fort Smith mainly because the reduction in rail rate from Fort Smith is more than offset by the distance Fort Smith is from Fort Norman. Hay River is closer to Fort Norman.

The rate from Hay River would be, of course, \$1.86 plus \$1.68, \$3.54. Now, that is not as big a reduction as you get to Yellowknife; it only amounts in this case to \$2.60 a ton. But, as I say, that is on the rail and barge movement.

On the highway and barge movement it would result in a considerable saving ~~because of the~~ highway and barge -- a lot of the material is shipped up there. I assume a certain tonnage goes by highway to Hay River and transshipped down the Mackenzie and that total rate now is \$4.26 via Northern and \$3.78 via Yellowknife. If the trucks had to meet rail competition at Hay River they would be reduced to \$3.54 via the current Northern rates, or \$3.06 via Yellowknife. That, of course, as I say, is about \$14 a ton on the truck movement.

One of the big movements, of course, is petroleum, and Mr. Gordon is in a much better position to discuss than I am because I understand he is



traffic consultant for an oil company. But, it is quite a heavy movement when we consider that between two and three million gallons of oil are consumed at Yellowknife. Most of that is trucked. In fact, everything they do not get from Norman Wells is trucked up to Hay River and moved across by barge. I assume in the winter time some might go around by the winter road.

Now, there are no published rates on this and that is why Mr. Gordon could probably give you more authoritative information. However, I happened to run into somebody who used to work for the Imperial Oil Company and he gave me some approximations which I think are pretty close. They charge between 12 cents and 14 cents a gallon to truck to Hay River. Is that pretty close?

MR. GORDON: I could not tell you offhand.

MR. GUEST: There are no published rates but I am informed that the diesel fuel is 14 cents, that gas is 12 cents, or within this range.

COMMISSIONER GAINER: Edmonton to Hay River or Grimshaw?

MR. GUEST: To Hay River.

COMMISSIONER GAINER: Trucking from Edmonton?

MR. GUEST: Yes. Now, if we assume 12 cents for the lowest rate, that is about \$1.45 per hundred pounds. A gallon of fuel diesel weighs about 8.2 pounds, and you can figure that there must be 7,000,



seven or eight thousand tons of oil moved by truck to Yellowknife in a year. That is a heavy movement.

Most oil moved in Western Canada by railway today goes under an agreed charge which has been mentioned here before. I looked for a comparable distance so I took the distance from Calgary to Dawson Creek, which is 690 miles, just a little shorter than the distance from here to Hay River, but it is pretty close. The rate under the agreed charge for bulk fuel petroleum products is 73 cents, which is half the truck rate from here to Hay River. This figure 70 cents is cropping up all the time, and I do not know why, but it is over \$14 a ton if the same rate applies -- I do not say it will -- but for the future competitive factor on truck and rail, the \$1.45 rate is going to be reduced, because the rail can haul it 700 miles much cheaper and make more money than the truck can.

THE CHAIRMAN: How much a ton-mile is that?

MR. GUEST: \$1.45.

THE CHAIRMAN: The 73 cents?

MR. GUEST: A little more than one cent a ton-mile.

THE CHAIRMAN: A little over that?

MR. GUEST: Yes, but not enough to worry about. Similarly I understand the rate on lubricating oil, and again this is not a published rate, but



on good authority, is \$3.40 a hundred to Hay River. Now, the rate on lubricating oil under any agreed charge from Edmonton to Dawson Creek -- and I was not able to get a comparable distance -- is \$1.32. Now, if we say roughly 500 miles from here to Dawson Creek, you add another 200 miles on and you might get a rate of \$2 a hundred as against the present rate of \$3.40 by truck.

This situation will result, will grow out of a competitive situation, and if we are talking about the interests of the people of the North and the development of the North, and if we put the emphasis on transportation, which the Minister of Northern Affairs does, because he said it is the most important factor, then we have to put our transportation facilities in a situation which will establish the lowest rate and make the possibility for the maximum amount of competition and the most economical utilization of all competing media.

It also happens, of course, if we are just quoting current rates, the fact that Fort Smith is 180 miles down the river puts it at a slight disadvantage to Hay River in relation to any point such as Fort Reliance, Yellowknife, or communities down the Mackenzie. I do not think it is an overwhelming point, but there is a saving on the basis of current barge rates by shipping out of Hay River rather than Fort Smith, so why not take advantage of it?



That is so much for this exhibit.

THE CHAIRMAN: That will be Exhibit 52-CCC.

---EXHIBIT NO. 52-CCC: Report submitted by Mr. Guest.

MR. GUEST: I just want to make a remark, with your permission, in regard to the Crow's Nest rates. We had some discussion on that here and they are an important factor as far as railway transportation is concerned. The railways maintain, and I will quote Mr. Sinclair, and this again is from the first hearing of the Royal Commission on Transportation, at page 10:

"Canadian Pacific will lead certain proof in that regard, part of which will show that if the general increases in freight rates in the postwar period had been applied to grain, in the period 1948 to 1958, the revenues of Canadian Pacific would have been approximately \$235 million higher than they are. The evidence will also show that in 1958 the statutory grain rates accounted for about 27 per cent of the work performed on the Canadian Pacific; but only brought in approximately 9 per cent of the freight revenue."

Of course, Mr. Sinclair makes this statement that there would be that much more revenue. That does not say the grain rates would be taking all the increase, but the railways are going to attempt to prove, both the Canadian Pacific and Canadian



National, that the grain rates are non-compensatory. In other words, they do not contribute anything to overhead. On the contrary, they are actually losing money. This is their objective.

THE CHAIRMAN: Is it not cheaper to haul gasoline than it is grain?

MR. GUEST: Is it not cheaper?

THE CHAIRMAN: Yes.

MR. GUEST: What do you mean?

THE CHAIRMAN: The rate you have given us from Calgary to Dawson Creek for gasoline is one cent a ton-mile, possibly a little more, and that seems to be even less than the statutory rates on grain.

MR. GUEST: No, the statutory rates are -- it is about .59.

MR. GORDON: That is the average.

MR. GUEST: .59, so we will say .6 -- pardon me, I am wrong -- it is .5 for the year 1958, according to the Waybill Analysis. The ton-mile is .5, which is just half of what you get on gasoline. Now, grain is much easier to haul.

THE CHAIRMAN: Do not worry about it. I was just mistaken.

MR. GUEST: I see. I was saying that the Crow rates are going to come in for a very intensive study. Now, this is very obvious, and it is my assumption that as a result of this study, if they



are found to be non-compensatory, the national treasury is going to be asked to assist if the Crow rates are going to be held down by statute, and if it is proven they are non-compensatory there will be a demand that a subsidy be provided out of the national treasury. Now, the railways and the representatives of the provinces -- I do not have to quote what is in here -- have both stated -- that is the Province of British Columbia and the Maritime Provinces -- the Prairie Provinces have not put anything on the public record in this regard yet -- but the railways, the Maritimes and British Columbia have stated that they do not want, they are not advocating an increase in the rate to the farmer, but they are advocating that some adjustment must be made.

Now, nobody has spelled out that dirty word "subsidy" but it is in the back of everybody's mind, including the representatives of the Prairie Provinces. Therefore, I do not think we should be too concerned about the revenue aspect of grain because it is going to be dealt with by the Royal Commission on Transportation, and undoubtedly a positive recommendation will be made in this regard.

I think that is about all I have to say, and I am sorry I took a lot longer than I thought I would.



COMMISSIONER GAINER: Mr. Guest, you have emphasized, I believe, the importance of the competitive factor, and you have used a particular illustration on the west route, the competition that might exist between trucking and the rail haul. With the exception of the intermediate points and with respect to the points north, Yellowknife and down the river, would you achieve about the same effect and perhaps further competitive effect if you were to route the railroad - let's say some eastern route - such that it ended up at or close to Hay River, so that, in any event, you could connect the barge services in the vicinity of Hay River?

MR. GUEST: I think the advantage of Hay River is that you have a port already there and you wouldn't have to build a port, such as you would have to at Ile du Mort. You have the competitive situation; there is no question that this would be immediately reflected in the reduced rate to the north. I am thinking in terms of the oil movement. I think it would be the same; you would get a competitive situation.

COMMISSIONER GAINER: That is, you can see no reason why the railroad would be at any less of a disadvantage. Let's put it this way, that it would be under the same pressure to compete with the highway services and certain water services, I presume?



MR. GUEST: Yes, and they can definitely compete when they get within 700 miles. They compete very effectively with the trucks in Edmonton. They requested the Board of Transport Commissioners to look into it and they investigated it and found out that the railway were making money on those rates. They will compete, and this is the basic point, the reduction in transportation costs, and certainly the most effective competition is truck competition with railways, particularly with this all the year round competition; the water is only seasonal.

THE CHAIRMAN: Could we have a ten-minute adjournment and you consider any questions you want to ask.

--- A short recess.

THE CHAIRMAN: Mr. Guest, have you anything you would like to add to what you have said?

MR. GUEST: I would just like to add a point. It has been mentioned that the difference in mileage between the two routes is an important factor favouring the shorter mileage to Edmonton or beyond. As a matter of fact, I think it has been suggested in the brief that it would cost \$200,000.00 a year extra to Pine Point. Now, I can't say it costs - I don't know what the rate is, of course, and while the railways gave Mr. Grimble a rate on gypsum, which they knew wouldn't move, anyway - they sure keep the rates



to themselves. I want to quote a rate that is published on zinc at Trail to the east, to Toronto. It is \$2.20, and the rate from Trail to Montreal is \$2.20 and the rate to Ottawa is \$2.20 a hundred, and there is in the order of 180 miles, I think, difference between Toronto and Montreal and Trail; and there are similar rates in eastern Canada. But I noticed particularly the eastern rates to Trail. They do group them. For example, it is a \$1.33 to Montreal, a \$1.33 to Cooksville, which is just outside Toronto. In other words, the difference in mileage isn't a great factor when you are moving commodities a great distance. If you are moving them a short distance it can be a considerable factor. But in moving commodities the difference of 60 miles, in my opinion, wouldn't even enter into the setting of a rate in this distance.

THE CHAIRMAN: Mr. Guest, might it not be of importance from another point of view? It looks, doesn't it, that this railway for a number of years will require a government subsidy to keep it going and it will cost something more to haul the goods that 60 miles, so if the rate is the same it just means that while the people who carry the goods don't pay anything extra, the Dominion Government will have to pay something extra in way of subsidy.

MR. GUEST: If the railway loses money - unless it has a tremendous tonnage from the start, of course, it will probably lose money. But when you



are moving goods 1500 miles, the calculation of 60 miles doesn't enter into it. On the movement of a commodity such as, in this case, concentrates, it is not an important factor.

THE CHAIRMAN: If the Government is going to pay it, shouldn't we perhaps consider something else? If the railway goes along the eastern route there will be a distance of 405 miles on which the Government would have to pay a subsidy to make up the loss. If it goes along the western route there is a distance of 450 miles on which the government will have to pay something.

MR. GUEST: There is extra cost, that is true, if we compare it on that basis; but if you look at the total cost of construction - I think Major Charles estimated that the shorter distance is going to cost even more than the longer distance because of the fact of bridges. So we have to look at the overall costs, and in this case the most costly line is the eastern line, and in using that logic you would charge more rates. But you don't make rates on that basis; you make rates on the basis of an argument between the shipper and the railway, and in this case the shipper is the Consolidated Mining and Smelting Company. There is a little bit of bookkeeping goes on. But I know, as far as the mileage is concerned, that is probably the last thing they would think of.

Our rates, lumber rates, pulp rates - the



mill at Hinton pays the same rate as the mill in Lewiston, Idaho. There is the same rate from Waterways or Grimshaw for lumber as they get at Prince George or Prince Rupert. When long hauls are involved, small distances, from the point of view of rates - I want to reiterate this - are not the important issue.

COMMISSIONER GAINER: Is this your argument essentially, that the operating costs of going these extra 60 miles are not going to be very much anyway?

MR. GUEST: Are we talking about the total distance?

COMMISSIONER GAINER: We are talking about the extra 60 miles out of, say, 1500 miles.

MR. GUEST: There is an increase in cost in operating an additional mileage. If you have 25 miles more the railway will have an increase in cost, obviously, to maintain it, but when you allocate that cost to a movement of freight over 1500 miles, then it becomes practically infinitesimal.

COMMISSIONER GAINER: So it is not going to affect your loss or profit very much.

MR. GUEST: Well, any increase in cost is a cost factor, but when you are calculating the freight rate, certainly the railways don't take this into serious consideration, in the distances we are talking about, 1500 miles.

THE CHAIRMAN: Perhaps the fact that the railways don't take it into consideration is a draw-



back when you have that extra 25 miles. In other words, the railway has to absorb the loss.

MR. GUEST: Well, somebody absorbs it. How you divide it up is a very difficult problem.

THE CHAIRMAN: If it is going to operate at a loss for a number of years, every additional loss is a factor, don't you think?

MR. GUEST: Yes, everything that contributes to cost you want to keep to a minimum.

Now, the cost of operating the extension, whether it goes from the west or the east - one is 25 miles further, longer, the other is 405 as against 430, to Pine Point - I couldn't say. Of course, nobody can say at the present time what the cost will be. The cost may be more expensive on the shorter mileage because of certain other factors, the total cost. Now, the cost of the 60 miles, say, from Pine Point to any given destination on the other side of Edmonton, from the point of view of rate-making, of making a rate, is a very small factor.

THE CHAIRMAN: Are you dealing with the question of costs? This is something, perhaps, that is not fair to ask you. In regard to the cost of operating the western route, it has been pointed out to us that there is a deep valley at Peace River that the railway has to go through, and Mr. Cooper for the Northern Alberta Railways didn't quote any figures. Do you know anything about that? Have you had



experience in railway operations?

MR. GUEST: No, I couldn't quote any - I certainly wouldn't even attempt to quote a figure on what it costs to handle that particular grade - whether they put an extra diesel on to it, whether they keep a diesel there. But it is a problem they would have to resolve. I think if they had to keep a crew there that would add to the cost; if they had to keep another diesel there the cost of the diesel would be very small.

THE CHAIRMAN: Then Mr. Cooper said it appeared to him and it would be necessary to have an extra division on the railway from Grimshaw to Pine Point, one more division, than between Waterways and Pine Point.

MR. GUEST: That would be an extra cost, but with diesels it is not a major cost. To service a diesel is different than when you used to have the installations for steam. It would be an extra cost. Even \$10.00, as \$50,000.00, is an extra cost, and this factor would have to be considered. It is a question of the importance of the cost in the total cost, in the total picture of costs.

THE CHAIRMAN: Thank you. Mr. Feehan?

MR. FEEHAN: No questions, sir.

COMMISSIONER GAINER: There is one question I would like to ask Mr. Guest. You mentioned at one stage that trucks would provide the most effective competition to the railroad. In other situations it is very often the water situation which provides



the competition.

MR. GUEST: Well, if you have all year-round water, yes.

COMMISSIONER GAINER: How would you evaluate the effect of that, of the water system on the east route with respect to competing with the rail line in the same vicinity? I am particularly thinking of down river, Yellowknife and north.

MR. GUEST: I think that the railway will haul freight cheaper. If they went to the east route, say to Fort Smith, it will haul it cheaper than the current rate. In other words, the competition would be the railway cutting the present rate, present combination rate, just as the railway will cut the present truck rate. In this case it is a completely different situation; it is the railway cutting the rates.

COMMISSIONER GAINER: It is not the same situation when you are moving against water.

MR. GUEST: Of course, if the railway is built on the eastern route it will increase the cost to the Athabasca area; that is if they move terminus of the barges to Peace Point. You see, you have two mediums which are competing during the summer season. If you moved the barge terminus to Peace Point or to Fort Smith, all you have is the same old combination, with no competition at all.



COMMISSIONER GAINER: Let's suppose we leave Waterways where it is where you have this competition over a stretch. Now, these two mediums would come into competition. Now, is that where it will stop, or is the water carrier likely to be able to go further in reducing these rates in competition?



MR. GUEST: Well, the rail rates would have to come down if the barge terminus is left at Waterways and the rail is built on the western route. To compete they would have to reduce their rates over the rates they would normally charge and which the railways do not intend to do because they have said they are going to get \$600,000, and the only way to get that is with the present combination to get the present rate. If they leave the terminus at Waterways they won't get \$600,000, assuming the factors are as now. They will get something less than that because they will have to cut the rate on the water. They will probably do what they do in Eastern Canada on their lake rates, where they reduce them in the summer during the lake season and as soon as the ice comes they promptly lift them up again. This is the situation which would exist here if the terminus was left at Waterways: they would reduce them during the barge season and hoist them back up again.

COMMISSIONER GAINER: I take it there is no legislative reason why this should not be done since it is done this way?

MR. GUEST: No.

COMMISSIONER GAINER: Would it be likely to hold or not in the case of agreed charge?

MR. GUEST: An agreed charge is the competitive rate essentially.

COMMISSIONER GAINER: And would be quoted



for the year round?

MR. GUEST: Well, I mean you can put any term in an agreed charge if the railway and the shipper agree on it.

COMMISSIONER GAINER: Do you know of any agreed charge that had differentials for seasonal rates?

MR. GUEST: There are agreed charges which have lake and rail rates, so when the lakes freeze up these rates are out and you have to use the other.

COMMISSIONER GAINER: But not under an agreed charge; is that it?

MR. GUEST: Well, let me think. I would have to check on that, but there are ---

COMMISSIONER GAINER: What would be your opinion?

MR. GUEST: I would not think -- if you have an agreed charge usually that is the rate which sticks all the year round. That is what I would say, subject to checking on that.

COMMISSIONER GAINER: That would be the most likely situation?

MR. GUEST: Yes.

THE CHAIRMAN: That is all we have to ask Mr. Guest. Thank you very much.

MR. BISHOP: Mr. Chairman, could Mr. Grimble make a few remarks apropos of what Mr. Guest has just said?

THE CHAIRMAN: Yes.



MR. GRIMBLE: I would like to keep this fairly short, but I would like to point out something with regard to the table on current and future rates mileages. I would refer you to the future rates of Edmonton to Yellowknife. The most direct mileage to Hay River would make this mileage figure 730 miles, which moves it into another category of \$1.91, instead of \$1.86, which makes a total for future rail to Yellowknife, combined rail and barge to Yellowknife, of \$2.06. This means by rail and barge through Fort Smith or Hay River the rate is the same.

COMMISSIONER GAINER: Based on the mileage of 730 miles at the rate of \$1.91?

MR. GRIMBLE: Yes.

THE CHAIRMAN: You estimate the mileage at 730 instead of 710?

MR. GRIMBLE: Yes. Actually the other was 605, so this does not affect the rate. The other feature regarding this is the fact that Mr. Guest has said those are the maximum rates the railways could charge, and so you presume since those are the barge rates in existence and the maximum rail rates that it is not the maximum rates that would likely apply to Yellowknife by the other route.

THE CHAIRMAN: What do you say about this distance, Mr. Guest?

MR. GUEST: Well, I estimated 710 miles.



Now, Major Charles said the railway was breaking off a few miles north of Alexander Falls, at Mile 355 -- if Mr. Grimble is correct, and he might be correct, I estimated it would be just a little bit, approximately at Enterprise, you see. That could be wrong and Mr. Grimble may be right, but I am not in a position to argue with Mr. Grimble at this point.

THE CHAIRMAN: We will probably get a little more on distance. There is not a great deal of difference anyway.

MR. GRIMBLE: Major Charles told me it was -- 335 from Grimshaw to Edmonton.

MR. GUEST: 328.

MR. GRIMBLE: Well, that is still \$1.91.

MR. GUEST: No, you go down five miles and into another rate.

MR. GRIMBLE: I said 730 and ---

MR. GUEST: As soon as you get past 725 you go down five miles and you will get the next rate.

MR. GRIMBLE: Edmonton to Grimshaw is 333.7, and add 395 to that makes 728.3, so the rate is \$1.91.

MR. GUEST: Okay.

THE CHAIRMAN: What is Edmonton to Grimshaw?

MR. GRIMBLE: 333.7, and Major Charles estimates through Hay River to Grimshaw as 395 by



the most direct route.

MR. GUEST: Did Major Charles put that on the record?

MR. GRIMBLE: Yes, it is on the record. If we apply this to page 2 we have for the future rates, Edmonton to Fort Norman, 366 via Fort Smith, compared to 359 via Hay River.

THE CHAIRMAN: Do either one of you remember how much freight goes into Yellowknife in a year?

MR. GRIMBLE: Twelve thousand tons to the Great Slave area via Northern Transportation, and 10,000 tons via Yellowknife Transportation Company. Approximately 20,000 tons a year to Yellowknife, nearly equally divided between the two. It does not include the winter road, which is six or seven thousand tons in the winter time.

THE CHAIRMAN: Twenty thousand tons in the summer?

MR. GRIMBLE: And six to seven thousand tons in the winter.

MR. BISHOP: Mr. Chairman, I would like to comment very briefly on Mr. Guest's point about the fact that the 64 miles extra distance, or the 30 miles extra distance, on the new part of the railroad may, I concede, very easily be lost in the matter of setting rates from a distance as far away as Trail. The ordinary situation where rates are set is done in the case of railways which already exist, and the



present Commission cannot overlook the fact that an extra cost created by a location is moved from one pocket to another if it is lost in the shuffle, as it were, of road making. In other words, it is not passed on to the consumer. In this particular case it is passed on to the railway and that also applies to the extra costs at Peace River. I think from your lordship's question you already appreciate that point.

I would now like to introduce to the Commission two gentlemen from the Sherritt-Gordon Mines, Mr. Rex Pearce and Mr. Bob Walford. After your lordship's question yesterday at noon, I think it was off the record after adjournment, but you explained to us your concern over the two propositions that taking the hypothetical case of mining development around the east arm of Great Slave Lake, one school of thought claimed that the eastern route would be an advantage because the products of such mining operations in the summer could be barged up to Bell Rock Harbour or Fort Smith and go down to Edmonton and points south and east via the eastern route, which would be shorter than going to Hay River and down through Grimshaw. The argument on the other side was that to take the products into Hay River, ship them by rail to Grimshaw or up around north of Grimshaw and across and down the Pacific Great Eastern and via C.N.R. to either Vancouver or Prince Rupert, would be much closer to



world markets.

You asked us to give some thought to this particular question and to get what information we could to provide answers. For that reason we have asked Mr. Pearce to come and give us the benefit of his views on the matter of handling of concentrates and where they can be treated.

Before we ask Mr. Pearce to speak to us I would like to point out that he was only asked a very short time ago to come, and it was not explained to him too well what the actual problem was. He has had very little time to prepare himself.

THE CHAIRMAN: Gentlemen, we appreciate very much your coming. You have come in from Fort Saskatchewan, have you?

Would it be more convenient for you to think about it till Monday and tell us then about the problems that Mr. Bishop has outlined to you?

MR. PEARCE: If I can speak for my colleague as well as myself, I think we would at least like to explore this question this afternoon. We are here, it has been brought up, and for myself I would like to explore it a bit. If questions come up which we cannot give you the answers to we would certainly appreciate the opportunity of going over it at the week end and coming back next week.

MR. BISHOP: I would like to ask Mr. Pearce to give us a rundown on what his position is, what his



experience is and possibly indicate on what subjects he feels most qualified to give an opinion. I am referring to the fact that there are various aspects of his business, or his company's business, on which he is obviously not an expert, so we would want his opinions taken on that basis.

MR. PEARCE: I am a graduate in Chemical Engineering from the University of British Columbia, a fair number of years ago. I have been working for a little over twenty years in the field of metallurgical engineering. I am a registered professional engineer in metallurgical engineering in the Province of Alberta and also the Province of British Columbia.

For the past five years I have been employed by Sherritt-Gordon Mines at Fort Saskatchewan. For the first two years I was in the operation of the nickel refining at Fort Saskatchewan, and for the last four years in the research and development division.

If I might just take a minute of my time to say that the operations at Fort Saskatchewan are divided into two divisions, the Chemical Metallurgical Division, which my colleague Mr. Walford is senior member of, is engaged in the production of ammonia, ammonium sulphate, nickel and copper sulphate.



THE CHAIRMAN: Would you mind repeating those?

MR. PEARCE: Very good, sir. There are two divisions. The first is the Chemical Metallurgical Division.

THE CHAIRMAN: And that is the division Mr. Walford is interested in.

MR. PEARCE: That is right, and this is the production division of the company, producing metallic nickel, about 25 million pounds a year; metallic cobalt, about 250,000 pounds a year; by-product of copper sulphide, and this is not a fully refined product, it is an intermediate. It contains about 4 million pounds a year of copper, and it is currently shipped to Noranda or to other custom smelters for refining.

THE CHAIRMAN: Where is it shipped to now?

MR. PEARCE: Noranda, in Quebec, and a certain amount to Tacoma, in the State of Washington.

For our own use in the refinery we have an ammonia plant. The bulk of the ammonia is used in processing nickel concentrate to nickel metal, but we do have available for sale a surplus of about 50 tons of anhydrous ammonia per day; and finally we produce some 400 tons per day of fertilizer grade ammonium sulphide, and we have available a by-product, iron, low grade iron, in the amount of about 300 tons per day. This amount is not of economic value, but we believe that, in the future, as the economy of



Alberta develops, this may become of value, and it is being stored against that development.

So much for the production division. The other division, which is at Fort Saskatchewan, is the Research and Development Division of the Company, and in that division I hold the position of head of the Industrial Department. A minute or two on that.

In a research organization you have scientists, skilled people in their particular fields, engaged in a great many investigational matters, ways to improve the process, the possibilities of making new products, the possibilities of taking new materials and processing them in a manner similar to our own, perhaps a way of treating new metals we are not now concerned with, and you eventually reach a point where you have something, you have a new discovery and you have a new process, and the question comes up, is it of any value? Can you exploit it? That is where the Industrial Department comes in in our organization. We act as liaison between the laboratory and industry which we hope will find use for it. I have been engaged on this work with Sherritt for the past four years.

When Mr. Bishop asked us to give some opinions on this matter of exporting concentrates or high grade ores which may be developed from mines in the Slave Lake area, there seems to me to be one point which should not be overlooked. This, sir, I would like to bring up, with your permission. It is not a technical



point, but at least one, I believe, which is of some importance. So far as possible, it seems to me - and I must say I am speaking personally at the moment, because I have not had the opportunity to discuss this with the manager - that the concentrates should be processed in Canada and should not be exported in raw form to the Pacific Ocean or to anywhere else. We need to produce finished products, certainly refined metals and possibly manufactured metals, in this province and in this area, and I think it is undesirable to export raw materials untreated. If, then, we accept this stand that, wherever economically possible, it is desirable to refine and partly to process raw materials in this area, you come to the question of where is the best location to put up a refinery. Here there seemed to us to be a number of points. I have got a note or two here; if you will excuse me, I should like to refer to it.

THE CHAIRMAN: Mr. Pearce, are you familiar with the letter which we received from your head office in Toronto?

MR. PEARCE: Yes, sir, I have read that letter.

As I pointed out to you, we have a relatively small production of copper, 4 million pounds a year. This at the present time is too small an amount for us to refine it economically at Fort Saskatchewan. Therefore we ship it to a custom refiners. If the



amount of copper available to us was to rise substantially, while I can't speak for my company, I think it is probable that we should examine very carefully the economics of going into copper production at Fort Saskatchewan. We have a process all worked out to do this. A description of this process was given before the Canadian Institute of Mining and Metallurgy in Ottawa this Spring, and we have done the laboratory work, we have piloted it. But it is certainly not economic at 4 million pounds a year.

COMMISSIONER GAINER: Do you have the reference of that technical paper?

MR. PEARCE: I can send you a copy. I think it will be published by the Canadian Institute of Metallurgy, but I don't think it has been published to this date. But I can certainly send you a copy.

When you put up a base metal refinery in an area where the by-products can be used, where there is an existing demand, then it seems to us that you generate additional wealth.

Here, sir, I should like to use the example of our own refinery at Fort Saskatchewan. I mentioned earlier this iron product which we have available to us. At the present time it is not economic to process this for iron recovery, but we are selling it, small quantities, admittedly, but some in its present crude form to two cement companies, one in Edmonton here and the other in Saskatchewan. They need iron



for their processing, and it has become mutually advantageous for us to supply them with that iron. If our refinery was a long way away from them we would not be able to do this; our point being that if you put up a refinery in the Edmonton area, for instance, there is sufficient industry already existent so that many of your products can be used, whereas if you built a refinery in a more remote area this would not be so likely, or even maybe impossible.

The other point is purely a practical one of operating a plant, and possibly my colleague Mr. Walford will speak better on that. However, I am on my feet. We think it is best to locate a modern refinery where there are other similar industrial organizations in existence, other refineries. Again if we take our own case in the Edmonton area, there exists a number of oil refineries, petro-chemical plants, some steel plants, and so forth. This gives us the advantage of having access to sources of skilled labour, the various ancillary services, such as a specialized welding shop or, if we need to get a piece of equipment fabricated out of steel plate, there are shops available to us in Edmonton.

Another small matter, but one which is certainly significant, is the fact that you have trans-continental airline services to Edmonton. We do a great deal of travelling and we have a number of customers calling on us. It is certainly a matter of



convenience to have good transportation for personnel. This we expect to find in an area such as Edmonton. Of course, the same thing would be equally true of Calgary or any such city with industries in existence.

Mr. Chairman, this is all I have to say at the moment; though if there are any questions I will try to answer them.

COMMISSIONER GAINER: Mr. Pearce, would you have any notion at this time as to what tonnage of copper concentrates you would have to have access to to go into the refining operation yourself?

MR. PEARCE: No, sir, I am sorry, I cannot give you a figure. It would possibly depend on whether we discovered a mine and it was our own or whether we were custom-refining it for somebody else.

COMMISSIONER GAINER: I see. It wouldn't be related, then, to the amount of tonnage you were going to put through, regardless of whether you drew it from your own mine?

MR. PEARCE: I don't think so. It seems to us you would get a greater profit from treating your own material than from merely custom-treating somebody else's.

THE CHAIRMAN: You mentioned that you not only produce nickel but cobalt, and you might produce copper. Are there any other raw materials that would be in the quality that you would refine here if available?



MR. PEARCE: At the present time our refinery is designed to recover these three elements only. Speaking rather quickly, I don't think there are any others that we could readily produce without substantial changes to the refinery.

THE CHAIRMAN: Lead and zinc are two commodities which don't fit in with the nickel processes.

MR. PEARCE: That is right.



THE CHAIRMAN: So you would virtually have to put up a new plant if you were going to try to refine lead and zinc?

MR. PEARCE: Yes. If we were to refine lead and zinc at Fort Saskatchewan we would have to have two new circuits, one for lead and one for zinc. These would certainly operate independently of the nickel and copper cobalt circuits that we now have. There would be obvious advantages, I would think, in the sharing of the research laboratories and the chemical laboratories and the maintenance jobs and the possible sources of raw materials. We make our own ammonia and produce steam and compressed air.

THE CHAIRMAN: What about arsenic and bismuth?

MR. PEARCE: We consider arsenic undesirable and we do not have any in our refinery right now. I was talking to Mr. Picard and we would go out of our way to not have any.

THE CHAIRMAN: I am reading from Mr. Bishop's brief at page 42 where he says:

"The findings to date indicate sources of nickel, gold, copper, lead, zinc, and gypsum besides silver, cobalt, arsenic, bismuth, tin, tungsten, fluoride, along with many others."

I am wondering how many of these substances can be refined at Fort Saskatchewan, or things that you are



not too far from being able to refine. You do not want arsenic?

MR. PEARCE: No, we do not. It is generally undesirable when you get it and you cannot sell it because it has very little market value.

THE CHAIRMAN: What about bismuth?

MR. PEARCE: Bismuth has certainly a market value. If a deposit was found with economic amounts of bismuth in it tributary to our natural area we would be interested in knowing about it.

THE CHAIRMAN: Could you refine it?

MR. PEARCE: We could not as we are now set up, but it is possible we might find it economic to put in a bismuth circuit in our existing plant.

THE CHAIRMAN: What about tin and tungsten?

MR. PEARCE: I do not think that either tin or tungsten would be particularly advantageous to our operation.

THE CHAIRMAN: What about barite?

MR. PEARCE: No, sir, barite, no.

THE CHAIRMAN: What about fluoride? Perhaps we do not want any now but suppose we did?

MR. PEARCE: From my experience elsewhere I would think that fluoride would be beneficiated to produce a high grade concentrate and then shipped where it was needed.

THE CHAIRMAN: You have mentioned the fact that you ship your copper concentrates.



MR. PEARCE: Yes.

THE CHAIRMAN: And you ship that as far as Noranda in Quebec?

MR. PEARCE: That is right.

THE CHAIRMAN: Can you tell us what freight rate you pay on these concentrates?

MR. PEARCE: I am sorry, I do not have these figures at my fingertips. We could find that out for you. Do you know, Mr. Guest?

MR. GUEST: It will be a published rate; it will be in the tariff, and Mr. Gordon has the tariff here.

MR. GORDON: No, I have not that tariff here.

THE CHAIRMAN: Mr. Jewitt told us that a ton of concentrates from Pine Point he thought would have a value at Pine Point of something like \$100 a ton. Could you tell us what a ton of copper concentrates might be worth at Fort Saskatchewan?

MR. PEARCE: A ton of our copper by-products, our copper concentrates would contain about 1200 pounds of copper. They would have a gross value, if one considers the sale price of the copper, and without considering any refining charges, of \$360. Now, you have to get it from Fort Saskatchewan to Noranda and you have to pay a refining charge to the Noranda Mines Limited. I am sorry, but off-hand I cannot quote those figures.



THE CHAIRMAN: Do you know about what the refining charges are?

MR. PEARCE: I am sorry, I would rather not answer that question because I am afraid I would mislead you. It would only be guessing.

THE CHAIRMAN: Actually the reason I am asking you is that I would be interested in knowing how much freight charges some of these concentrates can stand. Copper, apparently, can stand considerably more freight charges than lead and zinc.

MR. PEARCE: Yes, sir.

THE CHAIRMAN: It seems so?

MR. PEARCE: Well, lead and zinc sell for about 10 or 11 cents a pound, copper is about 30 cents a pound. Furthermore, these concentrates of ours from the Fort Saskatchewan refinery contain about 60 per cent copper.

THE CHAIRMAN: Is that common with regard to copper concentrates?

MR. PEARCE: No, it is unusually high. A normal copper concentrate would be about 25 per cent or 30 per cent copper.

THE CHAIRMAN: And worth perhaps half as much as your concentrates?

MR. PEARCE: Yes, that is right.

THE CHAIRMAN: \$180 a ton?

MR. PEARCE: You appreciate that is a gross value I have given you, not a net.



THE CHAIRMAN: The reason I was referring to that figure is because I think that is the figure Mr. Jewitt gave us for his concentrates. Do any of you remember that?

MR. FEEHAN: That was my understanding, if you took the actual value of the thing at the mine.

THE CHAIRMAN: Would that seem right to you, Mr. Pearce?

MR. PEARCE: I was trying to do a little mental arithmetic.

THE CHAIRMAN: I wonder if Mr. Picard can give us something on that?

MR. PICARD: It could be. It might be low, but I think it is probably right.

MR. PEARCE: It strikes me as being a little low and I am just wondering whether it is not a net figure. I am sorry, it is a little difficult to comment on what Mr. Jewitt says.

THE CHAIRMAN: You think the \$100 for the lead and zinc may be a net figure, do you?

MR. PICARD: It is too close to tell.

THE CHAIRMAN: What about nickel concentrates; how do they compare in value with copper, lead and zinc concentrates?

MR. PEARCE: We ship those from Lynn Lake in Manitoba to Fort Saskatchewan -- an approximate gross value, and I emphasize that it is gross, because I think it is a figure that has no real meaning,



\$200 a ton. If I might amplify those figures a little: a ton of concentrate has something like \$200 worth of nickel in it but it costs you a great deal of money to get the nickel out. Its value is not necessarily -- its real value is not \$200, it is \$200 less what it costs to get the nickel out.

THE CHAIRMAN: Can you tell us what that is?

MR. PEARCE: I am sorry, I cannot.

THE CHAIRMAN: Well, could you compare the costs of removing nickel from the nickel concentrates and the cost of removing lead and zinc and copper from those concentrates?

MR. PEARCE: It is certainly going to cost more to recover a pound of nickel from nickel concentrates than to recover a pound of copper from copper concentrates. It is going to cost less to recover a pound of lead or a pound of zinc from their respective concentrates than it does to recover a pound of copper.

THE CHAIRMAN: The cost of removing lead and zinc is less, copper is next less, and then nickel?

MR. PEARCE: Yes. I base this on the fact that lead and zinc sell for about 11 or 12 cents a pound and copper sells for 30 cents a pound and nickel sells for 70 cents a pound of metal.

THE CHAIRMAN: Ten cents, 30 cents and 70 cents?



MR. PEARCE: Yes, sir.

THE CHAIRMAN: More or less. If someone were to have a few hundred tons of nickel concentrates across the road from your plant at Fort Saskatchewan, is there any price that you would pay for it that you could quote for us?

MR. PEARCE: Yes, sir. We are currently treating nickel concentrate from two mines other than our own. I believe Mr. Brown in his letter that he sent to you mentioned them. One is the North Rankin Nickel Mine on Hudson's Bay and the other one is the Giant Nickel Mine near Hope, in British Columbia.

THE CHAIRMAN: What is the name of the first one?

MR. PEARCE: North Rankin.

THE CHAIRMAN: And the other one?

MR. PEARCE: Giant Nickel. I think that is its correct name, and it is near Hope, in British Columbia.

MR. SOUTHWORTH: Just newly started up.

MR. PEARCE: It has had rather a checkered history; it has started up and closed down several times but it is currently shipping to our refinery.

THE CHAIRMAN: Are you at liberty to tell us what you have paid for these concentrates?

MR. PEARCE: I cannot tell you, but even if I could I am not at liberty to do so.

THE CHAIRMAN: Do concentrates bring different



prices, depending on the nature of the ore from which they have been concentrated?

MR. PEARCE: Yes, sir, that is correct.

THE CHAIRMAN: Can you give us any range that there is with regard to the prices for refining lead, zinc, copper and nickel?

MR. PEARCE: That is a very difficult question to answer. First of all, the cost of refining any metal is going to depend on the nature of the concentrate, the tonnage which you were treating, and the area in which you are working.

THE CHAIRMAN: Perhaps I can help you a little with my question. As I understand it -- I may be wrong, and correct me if I am -- as I understand it there is a fairly well known schedule of prices that the Trail Smelter pays for lead-zinc concentrates and that is just simply a case of taking the value of the mineral and taking something for refining; is that right?

MR. PEARCE: That is right.

THE CHAIRMAN: Now, those prices are fairly well known at Trail, are they not?

MR. PEARCE: Yes.

THE CHAIRMAN: Does that sort of thing not apply with regard to the copper and nickel refineries?

MR. PEARCE: It certainly applies to copper refiners. There are a number of custom copper refiners operating and one which we have considered is



the American Smelting and Refining Plant at Tacoma, Washington.

THE CHAIRMAN: How does their price compare with the charges at Trail?

MR. PEARCE: I am sorry I do not know, but this information is published.

THE CHAIRMAN: Is it something that you and Mr. Bishop can work out together?

MR. PEARCE: We could certainly get that from the American Smelting and Refining Company who own the plant.

MR. BISHOP: We will undertake to get that.

THE CHAIRMAN: If it is fairly easy to obtain I would be interested in knowing what it is. I am at a complete loss now to know what type of prices might be charged. Is it in the range of two or three times or thirty or forty?

MR. PEARCE: No, I would think it is two or three times. I am working again on the fact that the price of copper is about three times the price of lead and zinc, and the processing costs will, for lack of anything better at the moment, be worked out in the same general relationship.

THE CHAIRMAN: You think it is less than five times?

MR. PEARCE: Yes.

THE CHAIRMAN: And more than twice?

MR. PEARCE: If you preface that with the



words "I think," then you are correct.

THE CHAIRMAN: And nickel, would you put that amount at about two to two and a half times copper?

MR. PEARCE: Yes, sir.

THE CHAIRMAN: You are relating that to the price?

MR. PEARCE: Exactly.

THE CHAIRMAN: You feel it is desirable to process our ores in Canada before they are exported?

MR. PEARCE: Yes, sir.

THE CHAIRMAN: Would you mind giving us your reasons for it? Perhaps there are some obvious reasons but there may be others we are not familiar with.

MR. PEARCE: If I might take the obvious ones first. I believe it was last night that Mr. MacKenzie, the President of the University of British Columbia, said in an address to some gathering that we should not indefinitely be hewers of wood and drawers of water for the United States of America. I heartily endorse this approach.

-

-

-



I heartily endorse this approach. For too long we have shipped raw materials of all kinds across the border and imported the finished products back again. Usually when you bring them back again you have not only to pay for the cost of processing them, but quite often it seems to have a customs duty on it at the same time. Our own case again is an example I should like to use. We produce metallic nickel, and this sells for about 70 cents per pound, Canadian funds, but if you go to a store to buy something which is fabricated of nickel you will have to pay a great deal more than just 70 cents a pound for that article containing nickel. Surely it is to the advantage of this country, and possibly this immediate area, for this processing to be done locally; and you develop the skills of the people, you employ people usefully, you increase the natural wealth of the country as a whole.

One other aspect I think I should like to mention, and that is we ship nickel from here to eastern United States where it is largely consumed by the steel industry. We can afford to do this because the freight rates are relatively low in proportion to the price at which nickel sells. We would like to fabricate this nickel to the point where it sells for perhaps a \$1.00 or a \$1.50 per pound in its fabricated form. This would allow us to pay a higher freight rate, which we would probably



have to do with a fabricated material, and still be better off. But we would enlarge our operations in Alberta, we would be increasing the gross national product of Canada, and benefiting everybody, as far as we can see.

There is one other point which I might drop in here, sir. If you fabricate along the line, if you process materials from the raw state to the refined state and then from the refined state to the finished product, you generate by-products all the time. This can be of significant value. Again referring to the Sherrit-Gordon plant, we ship out of our refinery more tons of products than we ship in. To put it very plainly and simply, we take natural gas, air and water from Alberta, we combine them with the nickel, copper, cobalt and sulphur that comes in in our concentrates, and we ship out more tons than we ship in. This seems to me to be an example of further processing in this country.

THE CHAIRMAN: Those are the reasons why you feel that we should process them.

MR. PEARCE: Yes, sir.

THE CHAIRMAN: What refineries are there in Canada of the nature of yours, Mr. Pearce?

MR. PEARCE: I am sorry, would you mind repeating that?

THE CHAIRMAN: I am not sure I know how to describe the thing I want to inquire about. There



is one refinery at Trail dealing with lead and zinc, isn't there?

MR. PEARCE: Yes.

THE CHAIRMAN: Is yours dealing with - -

MR. PEARCE: Primarily with nickel.

THE CHAIRMAN: Is it correct to speak of those as metal refineries?

MR. PEARCE: Yes.

THE CHAIRMAN: Are there many metal refineries in Canada?

MR. PEARCE: The next one due east of us is the Hudson Bay Mining Company's Refinery at Flin Flon.

THE CHAIRMAN: About how many are there in Canada altogether, do you know?

MR. PEARCE: I was just trying to make them up as I went along.

THE CHAIRMAN: Is it a matter of two or three or - -

MR. PEARCE: Half a dozen.

THE CHAIRMAN: Would you tell us which ones there are, then?

MR. PEARCE: International Nickel Company has a nickel refinery at Port Colborne in Ontario, and it has a copper refinery. It is on Lake Erie.

THE CHAIRMAN: That is a nickel refinery, is it?

MR. PEARCE: Yes. They have a copper



refinery at Copper Cliff, Ontario.

THE CHAIRMAN: They have separated their nickel and their copper refinery?

MR. PEARCE: Yes, sir.

THE CHAIRMAN: You propose to combine yours

MR. PEARCE: We are operating on a somewhat smaller scale, and they would be adjacent to each other at Fort Saskatchewan. Noranda Mines has a copper refinery at Montreal East, and I think, sir, that is all.

THE CHAIRMAN: Montreal East isn't Noranda.

MR. PEARCE: Well, their smelter is at Noranda, Quebec, and their refinery is at Montreal East, and there is a difference.

THE CHAIRMAN: There is a difference between a smelter and a refinery?

MR. PEARCE: Yes. At Trail they have both a lead smelter and a lead refinery.

THE CHAIRMAN: Would it be difficult for us to understand the difference?

MR. PEARCE: If you take the case of copper, take a concentrate - well, let me go back one step. If you take an ore that contains, say, 2 per cent copper, this is treated to produce a concentrate which might contain 30 per cent copper. This concentrate is smelted to produce a blistered copper.

THE CHAIRMAN: It is done by a mill?

MR. PEARCE: Yes. This is a physical



concentration, and the copper is not changed.

THE CHAIRMAN: This is copper concentrate.

MR. PEARCE: Yes, sir. This concentrate is then smelted, which is a furnace operation involving liquid or molten materials at high temperatures to produce blistered copper which, let's say, is 99 per cent copper.

THE CHAIRMAN: That is done mainly by heat, is it?

MR. PEARCE: Yes, sir. The one per cent of other materials that remain in the blistered copper are somewhat difficult to remove by further processing by furnace methods, and therefore you go to the last stage, which is the electrolytic refining, which produces, in effect, 100 per cent pure copper.

I am not entirely familiar with the geography, but I believe that the International Nickel Company's Copper Refinery is adjacent to their copper smelter, whereas Noranda's is several hundred miles apart. It is a matter of local economics; I don't think one can generalize on it.

THE CHAIRMAN: Do the refineries all involve electricity rather than heat?

MR. PEARCE: No, sir. We do no smelting at Fort Saskatchewan; we process nickel concentrate at 12 per cent nickel right through to 100 per cent pure nickel and use no electricity at all.

THE CHAIRMAN: You start with 12 per cent



nickel?

MR. PEARCE: This is a new process. Well, it was new five or six years ago. It was developed by Professor Forward at the University of British Columbia, working for Sherrit-Gordon. We believe it to have unique capabilities; we are endeavouring to extend its use.

THE CHAIRMAN: We have had somebody who told us that Professor Forward is experimenting with a new process for lead and zinc and hopes to use heat, thermal processes.

MR. BISHOP: That was Dr. Riley, Dr. Christopher Riley.

THE CHAIRMAN: And he hopes by a heat process to refine lead and zinc completely. Is that not so? Are you familiar with that?

MR. PEARCE: Yes, sir. I am not familiar with Dr. Riley's testimony, but certainly in the zinc process which we are working on now Professor Forward's idea is to treat zinc concentrate by hydro-metallurgical methods, similar to those which we use for nickel, to find a new method for producing zinc. It probably will involve the use of electricity for the ultimate production of the zinc metal, but the first stage of the process will be bleaching under pressure in water as opposed to the conventional furnace treatment of zinc concentrates. We are actually working on the development of that process at Fort



Saskatchewan at that time.

THE CHAIRMAN: Is that Dr. Forward's process that you are working on?

MR. PEARCE: Dr. Forward developed the process on behalf of Sherritt-Gordon. He is retained by Sherritt-Gordon as a metallurgist.

THE CHAIRMAN: It is half past four. I think we would like to discuss this still further. Would you gentlemen mind coming back next week?

MR. PEARCE: We would be very pleased to come back next week.

THE CHAIRMAN: We would like to hear about these processes. It may have some bearing on our report.

What time would be convenient for you, Mr. Pearce?

MR. PEARCE: Anytime on Monday, sir, would suit me well; if I could be excused from Tuesday.

THE CHAIRMAN: Suppose we say Monday morning at 10 o'clock.

MR. BISHOP: Mr. Chairman, both Mr. Baldwin and, I think, Mr. Southworth would be happier if we could start again on Tuesday. It occurs to me that maybe we could cover some of this material on Monday.

THE CHAIRMAN: Would you be prepared to be here for more discussion with Sherritt-Gordon?

MR. SOUTHWORTH: Yes, we would like to



be here.

THE CHAIRMAN: What about Wednesday, Mr. Pearce?

MR. PEARCE: Wednesday would certainly be suitable to us, sir.

THE CHAIRMAN: You have seen the balance of the brief, Mr. Southworth?

MR. SOUTHWORTH: Yes.

THE CHAIRMAN: Would there be anything wrong in going on with the rest of it on Monday and finishing it?

MR. SOUTHWORTH: If I can get here on Monday, I will.

THE CHAIRMAN: Suppose we adjourn now till ten o'clock Monday morning.

MR. BISHOP: Mr. Chairman, possibly if we are going to start on Monday morning we could start with Mr. Pearce. I am thinking of Mr. Baldwin.

THE CHAIRMAN: Mr. Southworth would like to be here.

MR. SOUTHWORTH: Very much. I would like to state that I think this will turn out to be quite a critical factor.

THE CHAIRMAN: Could we ask Mr. Pearce if he could come back on Wednesday morning?

MR. BISHOP: Well, Mr. Chairman, Mr. Southworth wants to be here whether we are hearing further from Mr. Pearce or going ahead with the brief,



so it doesn't make any difference.

THE CHAIRMAN: You don't care much about the rest of the brief; is that right, Mr. Southworth?

MR. SOUTHWORTH: I care about all of it, really. I will certainly try and be here all I can. If you adjourn till Monday I will try and be here. Tuesday is just more convenient, that is all. It is a matter of personal convenience.

THE CHAIRMAN: We will adjourn until Monday morning at ten o'clock.

--- Adjournment.

ROYAL COMMISSION
ON
GREAT SLAVE LAKE RAILWAY

HEARINGS

HELD AT
EDMONTON, ALBERTA

VOLUME No.: 19

DATE:

Oct 17/59

OFFICIAL REPORTERS
ANGUS, STONEHOUSE & CO. LTD.

372 BAY STREET
TORONTO

EM. 4-7383

EM. 4-5865



ANGUS, STONEHOUSE & CO. LTD.
TORONTO, ONTARIO

ROYAL COMMISSION ON
THE GREAT SLAVE LAKE RAILWAY

Hearings of the Royal Commission
on the Great Slave Lake Railway
held at the Court House, Edmonton,
Alberta, at 10.00 a.m., October
19th, 1959.

PRESENT:

MR. M. E. MANNING	Chairman
MR. WALTER D. GAINER	Member
MR. JOHN ANDERSON-THOMSON	Member

MR. FRANCIS M. FEEHAN	Counsel
MR. A. PATERSON	Secretary



THE CHAIRMAN: Gentlemen, are we ready to go ahead?

Mr. Pickard, you have very kindly told my colleagues and myself you wouldn't mind coming here this morning and answering some questions that we would like to put to you.

MR. PICKARD: Very good.

THE CHAIRMAN: If you don't mind, I would like to put your position on the record, the position you now occupy. You are now General Manager of the Yellowknife Gold Mines Company Limited.

MR. PICKARD: This is correct. I have held this position for approximately three years.

THE CHAIRMAN: And you have lived in Yellowknife during that time.

MR. PICKARD: I have lived in Yellowknife during that time. I have been with the mine and in a number of positions during that time - Mine Superintendent, Chief Engineer, in the Geology Department.

THE CHAIRMAN: And in the positions you have held you have had experience with exploration in the Northwest Territories.

MR. PICKARD: Yes, although somewhat limited in the Northwest Territories at this stage, somewhat limited in the Northwest Territories.

THE CHAIRMAN: Have you had much experience in the Northwest Territories in exploration?



MR. PICKARD: A fair amount. I was in the Yukon for some years, and, of course, I have done exploration work in various other parts of the country.

THE CHAIRMAN: But as General Manager of the Giant Company, part of the work you have managed is exploration work.

MR. PICKARD: Yes.

THE CHAIRMAN: And while your company produces gold, I take it you are also interested in exploration for basic metals.

MR. PICKARD: This is correct.

THE CHAIRMAN: And you are naturally interested in freight rates, both coming in and going out.

MR. PICKARD: This is correct.

THE CHAIRMAN: I suppose both from a personal point of view and from a company point of view.

MR. PICKARD: Anything that would reduce the cost of living would be desirable.

THE CHAIRMAN: As you know, we are interested in trying to find out what merits there are for the alternate routes that have been proposed for a railway going up to the area south of the Great Slave Lake. We would like to ask you some questions which bear on it. If there is anything you can tell us in addition to those questions we ask you, we would appreciate you doing so.

First of all, I would ask you: what are



the geological prospects of that area which lies between Great Slave Lake and Lake Athabasca? - and you can see from the map on the wall the area we are thinking.

MR. PICKARD: Well, I think there are reasonable possibilities here. Over the weekend I took the opportunity of studying this map briefly, and you can see, perhaps, on this map, this particular map - -

THE CHAIRMAN: Would you indicate the map you are referring to? We are looking at the map which is exhibit 52 (b).

MR. PICKARD: Now, the area here is in the Pre-Cambrian; this area, too, is in the Pre Cambrian.

THE CHAIRMAN: The first area you have referred to is between the lakes, and the second one is north of the Great Slave Lake.

MR. PICKARD: Yes. These areas in blue, green and light gray are later sedimentary deposits. I considered, perhaps, the relative merits of this area, of this area and of this area.

THE CHAIRMAN: You are now referring to, first of all, the area in pink between the two big lakes.

MR. PICKARD: Yes.

THE CHAIRMAN: Secondly, the area in blue between the two big lakes.

MR. PICKARD: Yes.

THE CHAIRMAN: And, thirdly, the area in



pink north of the Great Slave Lake.

MR. PICKARD: Yes, this is correct. It is, admittedly, difficult to determine which area has the most merit from a geological point of view. You might find a mine in any geological situation, but I feel that probably this area stands a better chance than, say, this area or this area.

THE CHAIRMAN: That is, the area north which is marked in pink, north of the Great Slave Lake, you think is better than either of those two areas south of the lake.

MR. PICKARD: I think this is perhaps true, but I would like to remind you that mines are frequently found in areas which are regarded as not favourable. Now, I didn't consider, assuming that this is - say you assume that this is the most favourable area, the area north of the Great Slave Lake. I said, "What effect will a railway have on the east route or one along the proposed western route?" I can see little advantage to either route, apart from the fact that whatever will get the lowest rate base I feel will be the best route.

THE CHAIRMAN: That is, with regard to the area north of the lake?

MR. PICKARD: This is correct.

THE CHAIRMAN: You haven't considered the area south of the lake.

MR. PICKARD: This is correct. Now, you can see this area, this is McMurray, Peace River. Now,



around each road I drew a line here and a line here.

THE CHAIRMAN: The dotted lines?

MR. PICKARD: Yes, these are dotted lines.

THE CHAIRMAN: They are all dotted. Suppose we number the lines 1, 2, 3 and 4.

MR. PICKARD: These are dashed and these are dotted. Line number 1 is approximately 120 miles east of the eastern railway, line number 3 is approximately 120 miles west of the east route, line number 2 is approximately 120 miles east of the west route, and line number 4 is approximately 120 miles west of the west route.

Now, the shaded area in between represents the area which is common to both of these areas. Does this make sense to you?

THE CHAIRMAN: What you are doing is considering an area 120 miles on each side of the two proposed routes.

MR. PICKARD: That is right. So this is the area for the eastern route and this is the area for the western route and the shaded area is the area which is common to both. As the shaded area is in both, we can ignore it and consider these.

THE CHAIRMAN: Now, let's call these routes W and E, for the western area, and the eastern area.

MR. PICKARD: And then I said to myself, If I had \$500,000.00 where would I rather spend it for prospecting? - in the west section or in the east



section - and I was forced to the conclusion that I would rather do it in the eastern section.

THE CHAIRMAN: Would you consider spending all of it or any part of it in the western section?

MR. PICKARD: I think your chances would be much more remote than they would be in the eastern section. If I was given the choice between east and west, I would spend it in the eastern section.

COMMISSIONER THOMSON: You are talking now strictly of minerals.

MR. PICKARD: Yes, nothing else, but metallic minerals. This is all I know anything about. I can't debate the merits of wood farms or any other product but metallic minerals, and I would say that your chances of finding metallic minerals in this section would be better than in this section.

THE CHAIRMAN: You would say they are better in the east section than in the west section.

MR. PICKARD: Yes.

THE CHAIRMAN: Would you mind if we have your diagram, Mr. Pickard.

MR. PICKARD: Well, I hate to have something like that go into a permanent record of the Dominion of Canada, but you are welcome to it.

THE CHAIRMAN: We will mark it as an exhibit.



THE CHAIRMAN: Your diagram is marked 52 (ddd) and covers the area south of Great Slave Lake.

MR. PICKARD: Yes. I regarded this problem as separate from this one, because I don't know of anything that you can do south of the lake that can have - it might have an influence, but I don't think - -

THE CHAIRMAN: You are saying that the problem in the south is different from the problem in the north.

MR. PICKARD: Yes.

THE CHAIRMAN: You referred to what you would do if you had \$500,000.00 for prospecting, and you say you would spend it all in area E in preference to area W.

MR. PICKARD: This is correct.

THE CHAIRMAN: What would you say of the shaded area that is common to both routes by way of comparison with area E? Would you spend part of the \$500,000.00 in the shaded area?

MR. PICKARD: I feel that the possibility in the shaded area is largely confined to a lead-zinc deposit, similar to that in Pine Point, and I don't think the chances of finding anything else are too good. But you might find one.

THE CHAIRMAN: That is a very worthwhile thing to find.

MR. PICKARD: That is very true.

THE CHAIRMAN: Would you consider spending



part of the \$500,000.00 in the area that is marked - -

MR. PICKARD: I would like to fly over the ground and have another look at it. I think that you would have to rely entirely on geology.

THE CHAIRMAN: As it is a very good area.

MR. PICKARD: Oh, yes. If someone could dream up of a way of doing it in that area, but it is a very difficult area to prospect.

THE CHAIRMAN: Would you look at the eastern part of the shaded area?

MR. PICKARD: Well the eastern edge would be a logical one as you can see it. I can't remember enough about it. It is an area - what I would say is that it is an area that, as it has a lead-zinc deposit of this type in it, could have another one. I would like to go and have another look at it before I would say definitely.

THE CHAIRMAN: To complete our record, the reason you feel that the area that is shaded is difficult for prospecting, I think is this, isn't it, that the horizons where you would be likely to find the metallic deposits are deeper and deeper under the ground as you travel further west.

MR. PICKARD: This is correct.

THE CHAIRMAN: That is the reason why prospecting is difficult.

MR. PICKARD: Yes.

THE CHAIRMAN: As geophysical methods are



improved, it is conceivable that you can penetrate further and further into the ground.

MR. PICKARD: Yes. Geophysical methods have improved and will improve in the future.

THE CHAIRMAN: To come back to this situation of comparison between north and south of the lake, if you had \$500,000.00 to spend in prospecting, could you tell us how you might allocate it between the north and the south?

MR. PICKARD: I think this perhaps puts me in a rather difficult position, as part of our company policy is involved in this. All I did say is that I thought that perhaps this area might be somewhat better than this area, but I don't think I could say anything further than that.

THE CHAIRMAN: You would rather not say anything further.

MR. PICKARD: I would rather not.

MR. BISHOP: You don't feel you could give any indication as to why you think the area north of the lake would be more favourable than the area south of the lake.

MR. PICKARD: Well, there is one thing: the area there is quite a bit bigger in the north, and the second point is that in the area north of the lake there are four producing mines. In the area south of the lake there are innumerable showings; the same holds true of the area north of the lake. I don't know;



I just have that feeling. I really can't say an awful lot more than I have said. I start getting into details, and I would rather not do that.

THE CHAIRMAN: It has been suggested to us, Mr. Picard, that in the area north of the lake there are a lot of intrusive-type of rock formations or more of that type of rock formations in the north than in the south.

MR. PICKARD: This is possibly true.

THE CHAIRMAN: And these are places that, in the past, people have gone to for prospecting. You have a preference as a prospector for the area north than the area south.

MR. PICKARD: This is modestly true, yes.

THE CHAIRMAN: Would you come to the area south of the lake? Would it be reasonable to say that one of the most interesting portions of the area south of the lake is that part that is immediately tributary to the lake itself?

MR. PICKARD: This area contains innumerable small copper showings.

THE CHAIRMAN: If the mines were to be developed fairly close to the south of the lake, you would think the ore would be likely to be taken out.

MR. PICKARD: Well, you would either barge it down to this area - although this region of the lake stays frozen for a considerably longer period, that is the main portion of the lake - or it might be possible



to find some sort of a truck route, or rail route. You have just one big river across and another smaller river

THE CHAIRMAN: If the ore were to be taken out by water, that would involve winter stock-piling, wouldn't it?

MR. PICKARD: This is correct.

THE CHAIRMAN: I would like to ask you a question or two about this question of winter stock-piling of ore. It is done, isn't it, at a mine on the shore of Hudson's Bay.

MR. PICKARD: Yes. They stock-pile concentrates.

THE CHAIRMAN: It is milled and the concentrates are piled there and then taken out in the relatively short period during the summer when the water is open.

MR. PICKARD: This is correct.

THE CHAIRMAN: Do you think there is a serious problem for a mining company to stock-pile like that instead of sending it out day by day as it is concentrated?

MR. PICKARD: Well, you are involved there with storage charges, interest on your money spent, and this sort of thing. I don't know how serious it is. There is a mine up on the east coast of Greenland that does stock-pile over a fantastically long time, and it is a small mine. I think the shipping



season is something in the order of six weeks to two months.

THE CHAIRMAN: Do you know of any other places where concentrates are stock-piled?

MR. PICKARD: I am just trying to think of what happens to the iron ore in Labrador. Their shipping season must be relatively limited; the same thing at Steep Rock, what happens there. I am reasonably sure they don't suspend their mining operations.

THE CHAIRMAN: As you have looked for base metal deposits around Great Slave Lake, would it be fair for me to ask you if you have considered the problem of stock-piling a very serious one?

MR. PICKARD: I haven't considered it too closely.

THE CHAIRMAN: You have mentioned also the fact, Mr. Picard, that concentrates might be trucked from a mine to wherever the railway ends close to the south shore of Great Slave Lake.

MR. PICKARD: Yes.

THE CHAIRMAN: That would have to be done in the wintertime, wouldn't it?

MR. PICKARD: I would think so.

THE CHAIRMAN: And the evidence we have, I believe, is that a winter road can be made up just about as good a highway as a paved highway.

MR. PICKARD: I don't know that I would go that far, but they do get them in pretty good shape



at times.

THE CHAIRMAN: You say it would be comparable.

MR. PICKARD: I am thinking of an incident where I saw three or four trucks up to their arm pits in a bog hole on one occasion with "cats" trying to pull them out. On occasion they can be made very successful. It depends on the factors involved right at the time.

THE CHAIRMAN: They can be made to work.

MR. PICKARD: Yes.

THE CHAIRMAN: Pretty well.

MR. PICKARD: Pretty well.

THE CHAIRMAN: Would you generalize along those lines and tell me whether concentrates can stand a fair-sized truck haul, something in the order of 200 miles.

MR. PICKARD: Well, they do in the Yukon.

THE CHAIRMAN: That is what I understand.

MR. PICKARD: Yes, they stand then in the Yukon. That is a high-grade concentrate admittedly, but their costs are something in the order of 5 cents per ton mile. If you have the volume of concentrate, I would assume you could get trucking costs in other northern regions down to this level.

THE CHAIRMAN: Even for a period of five or six months in the wintertime?

MR. PICKARD: This is very difficult; you



have the interruptions.

THE CHAIRMAN: Could you estimate what the trucking costs might be reduced to for a haul over a winter road?

MR. PICKARD: I suppose if you had the volume you might get them to 10 cents or 15 cents per ton mile.

THE CHAIRMAN: You don't expect to get them to much better than that for a winter operation?

MR. PICKARD: Not for a winter operation which is interrupted and started again the following winter. Your opening up costs are involved and your closing down costs are involved.

THE CHAIRMAN: Would you compare what you think are the merits of the two proposed railway routes from the point of view of mineral development?

MR. PICKARD: To summarize this briefly, I don't think it makes too much difference whether you use the eastern or western regarding this area.

THE CHAIRMAN: This is the northern area?

MR. PICKARD: Yes, the northern area. I think, comparing these two areas, that is all - -

THE CHAIRMAN: East and west?

MR. PICKARD: I would prefer to see it on the eastern route without doubt, just comparing these two areas.

THE CHAIRMAN: That is the areas marked W and E on your diagram which is exhibit 52 (ddd)?

MR. PICKARD: That is right.



THE CHAIRMAN: Could you tell us whether you think the proposed eastern route is much better than the proposed western route, or if you cannot tell us just so far as you feel you would like to?

MR. PICKARD: Well, for a possibility of finding and developing a mine in this area ---

THE CHAIRMAN: That is the eastern area?

MR. PICKARD: Yes, I would prefer to see the east route over the west route.

THE CHAIRMAN: Now, there is another aspect about this that I would like to ask you a few questions on, and it arises from some of the evidence that we have had concerning what might take place in the Peace River area. It is hoped that there will be a very large hydro-electric power development there and this may result in some industrial development. There is, as I think you know, oil and gas there in substantial quantities, and there is coal in that area in substantial quantities. The suggestion has been made that there is an advantage to taking the ore concentrates from around the Great Slave Lake down into the Peace River area so that it may participate in the industrial development that might be there. I take it that the suggestion is this, that if one has a large quantity of mineral ore around Great Slave Lake if he could take it down the proposed eastern route he could have it treated in the refinery at Fort Saskatchewan or



in the refinery at Trail. But, if he were to be able to take it down the proposed western route he could still bring it to Edmonton, he could still take it to Trail, but he could also take it to the Pacific coast or he might also be able to have it treated in a smelter or refinery that might be built in the Peace River area. Can you tell us what you think of that situation?

MR. PICKARD: I suppose it is a possibility. I am only guessing now, but on smelting costs -- and probably the experts will disagree with me -- I would say that heat or power are or can be a reasonably substantial portion of your total smelting costs. Probably, therefore, cheap power may not lower smelting costs. Plant depreciation is also a large percentage of your cost. I do not know if the fact that world markets are available here and are not available here is too important.

I would ask you what is the difference in freight rates from Peace River to Vancouver and Edmonton to Vancouver.

THE CHAIRMAN: I do not know those.

MR. PICKARD: Is this a substantial difference?

THE CHAIRMAN: Mr. Gordon, can you tell us that?

MR. GORDON: I could not tell you the exact cents per ton difference but under the existing



circumstances at least the freight rate from Edmonton would be considerably lower to Vancouver than from the Peace River country except by the P.G.E. to possibly the Peace River country. If it was where they could be delivered to P.G.E. directly the P.G.E. would have some advantage over Edmonton, but it would not be as great as taking the Peace River country tributary to the Northern Alberta Railways as against Edmonton. Without tariffs you could not -- I would not attempt to say what the difference is.

COMMISSIONER GAINER: For future reference could you pull us out a couple of figures on these mileage figures, the P.G.E. from Peace River to Vancouver?

MR. GORDON: Fort St. John ---

COMMISSIONER GAINER: It would have to be Dawson Creek.

MR. GORDON: Around through Dawson Creek, yes, I can do that. There would be no concentrate rates published via that route but we could go on mileage.

COMMISSIONER GAINER: Perhaps you can do the same with Edmonton to Vancouver by both Canadian National and Canadian Pacific.

MR. GORDON: I can do that for you, yes.

THE CHAIRMAN: Do you think it is a problem of comparison? Do you think it is a problem of freight rates?



MR. PICKARD: No, not entirely. I think freight rates definitely should be considered, but in any smelting problem there are a great variety of factors to be considered. I do not think you can make an offhand answer to this; I think it requires study of the problem by someone who is definitely familiar with it. I do not think you could make an offhand answer like that.

THE CHAIRMAN: Suppose there was a smelter in the Peace River area, from the point of view of one who might have concentrates for sale, would you regard it as an advantage to have the choice between selling your concentrates in Peace River and in Edmonton or Trail?

MR. PICKARD: I think it is always an advantage to have two or three people bidding for concentrates. Competition enters into it, and I think it is a good thing from the seller's point of view.

THE CHAIRMAN: Well, from that point of view there would be some merit in the western route over the eastern route if the smelter was to be built in the Peace River area?

MR. PICKARD: One thing I think I should remind you of: even if there was a smelter in Peace River and one in Trail and one in Edmonton, it is conceivable that it might still be, you might still get a better deal from some place like Tacoma, or somewhere else. The smelting business is not too straightforward, you have to consider many factors, as I said



at the beginning, and consider from an engineering point of view just where you do get the best deal.

THE CHAIRMAN: The Tacoma smelter is on the west coast, is it not?

MR. PICKARD: This is correct.

THE CHAIRMAN: It would be easier to get to the Tacoma smelter via the western route -- if it were easier to get to the Tacoma smelter via the western route that would be one advantage that the western route would have over the eastern route?

MR. PICKARD: Yes ---

THE CHAIRMAN: Well, do you think it would be an advantage?

MR. PICKARD: It might be, but on the other hand you have a smelter right down in Montana here and the other route might prove advantageous.

THE CHAIRMAN: And the smelter in Montana is one which throws an advantage over towards the proposed eastern route, does it not?

MR. PICKARD: I would think so.

THE CHAIRMAN: Where is the smelter in Montana?

MR. PICKARD: There is one at Helena, is there not, Mr. Pearce?

MR. PEARCE: I think the one you are talking about is in Great Falls; that is the copper smelter. There is also a zinc plant.

MR. PICKARD: There is something in Helena?



MR. PEARCE: I believe Anaconda have an integrated copper and zinc smelter at Great Falls in Montana.

THE CHAIRMAN: Do they do custom work?

MR. PEARCE: Yes, sir.

THE CHAIRMAN: And what is handled at Great Falls?

MR. PICKARD: Copper, primarily.

MR. PEARCE: Copper and zinc concentrates.

THE CHAIRMAN: What about lead?

MR. PEARCE: No, I do not think so.

THE CHAIRMAN: What is handled at Tacoma?

MR. PEARCE: Mainly copper, but the Tacoma smelter has a reputation for taking practically anything you are ready to pay to have them treat.

MR. PICKARD: This is correct.

MR. PEARCE: Mr. Picard knows that. They will take highly arsenical materials that no one else in the world would take.

MR. PICKARD: Provided you can pay for it, they will try to treat it.

THE CHAIRMAN: Are there other smelters in the northern part of the United States that does custom work?

MR. PICKARD: There is one at Selby, California.

THE CHAIRMAN: Is that close to the coast?

MR. PEARCE: It is close to the coast.



There is a smelter in Salt Lake City; I do not know whether they take custom materials or not, but I understand they do.

THE CHAIRMAN: What about Selby, California; is that within reach of concentrates that were produced in Canada?

MR. PEARCE: If you can get your concentrates on to ---

MR. PICKARD: Prior to this recent strike we were going to ship some material on an experimental basis, but they struck just as the final agreement was about to be signed.

THE CHAIRMAN: Are you at liberty to tell us what you were thinking of shipping?

MR. PICKARD: No, I think not. This was a by-product from our own plant.

THE CHAIRMAN: Mr. Gainer, have you any questions?

COMMISSIONER GAINER: Just a couple of points to clear up the smelting and refinery position. There is just one in Montana -- Great Falls, is it?

MR. PICKARD: I was always under the impression there was one at Helena.

MR. PEARCE: There is one at Butte and Anaconda. Those two towns are quite close to one another, a matter of about ten miles. I think part of the plant is at Butte and part of it at



Anaconda. Great Falls is some distance away and this is where their zinc plant is.

COMMISSIONER GAINER: So that covers copper and zinc. There are facilities for copper and zinc in Montana?

MR. PEARCE: Yes, also Bunker Hill. There is a lead smelter at Kellogg in Idaho, Bunker Hill and Sullivan.

COMMISSIONER GAINER: That covers Idaho and Montana. How about Washington?

MR. PICKARD: Tacoma is the only one.

MR. PEARCE: Yes.

COMMISSIONER GAINER: California?

MR. PEARCE: Utah.

COMMISSIONER GAINER: Utah was copper?

MR. PEARCE: Yes. There used to be a lead smelter there but I believe it was closed. It was at a place called Midvale, but I think it is closed.

COMMISSIONER GAINER: There must be something in Colorado?

MR. PEARCE: I do not think there is. There used to be many but I do not think there are any operating today.

COMMISSIONER GAINER: And one in California?

MR. PICKARD: Yes, one.

MR. PEARCE: So far as I am aware.

COMMISSIONER GAINER: So there would be



copper, zinc and lead, and possibly amounts of other things on a special basis?

MR. PEARCE: That is right.

COMMISSIONER GAINER: Now, there is a break, is there, until we move east a considerable distance?

MR. PEARCE: There is a zinc plant in Illinois.

COMMISSIONER GAINER: That would be the farthest one west?

MR. PICKARD: What happened to St. Louis? Everything is quoted on St. Louis.

MR. PEARCE: I do not think it is refined there. There is a refinery in Oklahoma. I suppose they speak of St. Louis because it is a transportation centre. The river boats congregate there. There is one, a zinc plant, I believe, in East St. Louis, but I am not too sure of that. This is getting too far away from northwestern Canada to be of much importance.

THE CHAIRMAN: What about the one in Utah? That would have to be reached by rail, would it not?

MR. PEARCE: Yes.

THE CHAIRMAN: And it is a long way off?

MR. PEARCE: Yes, and there is an angle there. In the Kenicott they have relatively pure copper concentrates from their own mine, and they treat in the smelter and they are somewhat reluctant to take outside impure concentrates and put them into their smelter. It is my understanding that



the requirements for custom concentrates are very strict. This is understandable because we have the same thoughts in Fort Saskatchewan on nickel concentrates.

THE CHAIRMAN: I am told there is some possibility of a copper smelter at Merritt, near Kamloops.

MR. PICKARD: I think there has been some discussion about this, too, but I very much doubt it.

MR. PEARCE: I would endorse that opinion.

COMMISSIONER GAINER: On what grounds?

MR. PICKARD: On economic grounds. This is merely, again, a combination of rumour and opinion.

COMMISSIONER GAINER: There is only one other question and I am not sure it has too much bearing, but I would like to ask your opinion, Mr. Picard. In the event of the mining industry being opened up north of the lake, say the central north region, would you expect there to be any advantage in the centre of gravity if you have transportation being either to the east or west of the lake?

MR. PICKARD: Would you mind pointing out on the lake where you mean by the centre?

COMMISSIONER GAINER: I am thinking of moving ore from the edge of the Pre-Cambrian and in the region of the north arm and the northeast arm.

MR. PICKARD: Yes.

COMMISSIONER GAINER: Would you expect the



cetnre of gravity for road systems, and so on, to go east or west around the lake, or would there be any particular reason, any particular advantage?

MR. PICKARD: Supposing you found a mine there.

MR. FEEHAN: Suppose you presume this copper plant proves up to be a large orebody?

COMMISSIONER GAINER: What I am asking you is, would it be likely to have any bearing on any such development in the north as to which road was chosen for the railroad? Would Fort Smith seem any more attractive as a point to transship from than Hay River or Enterprise?

MR. PICKARD: Well, just the shortest distance is the only problem there.

COMMISSIONER GAINER: Well, I am wondering about that. Would the terrain have anything to do with it?

MR. PICKARD: Very definitely. The least costly highway system -- and that would not necessarily be related exactly to distance, I presume.

COMMISSIONER GAINER: Would you say this Pre-Cambrian terrain would be much more difficult?

MR. PICKARD: I would think so. I must admit I have flown over this. Is this very marshy here?

COMMISSIONER THOMSON: Well, if you followed the normal road struck off on Fort Rae it would be possible. The new road comes up past Lac La Marte.



If you go west of that you are in bad terrain, but this terrain is very good as far as Fort Rae.

THE CHAIRMAN: That is from Fort Providence to Fort Rae?

COMMISSIONER THOMSON: Yes, it is ideal. It is excellent terrain. However, if you went west in that area you would be in bad country again.

COMMISSIONER GAINER: One point that might be raised, I suppose, in the case of a development, let us say, at Mud Lake, it might be trucked down to existing roads?

MR. PICKARD: Well, supposing you did this: supposing you -- you always consider what is in at the moment, and you try to build from there, do you not? I would say obviously you would bring it to there.

THE CHAIRMAN: You mean Fort Rae?

MR. PICKARD: That is correct.

COMMISSIONER THOMSON: You are only 100 miles --- ?



MR.PICKARD: There is no question about that at all. If you had one there, assuming that the distance was the same to there as to there. In the back river country - -

THE CHAIRMAN: You would find something in the back river country - it is pretty hard to say.

MR.PICKARD: That is correct.

MR. FEEHAN: I have one or two questions.

Mr.Pickard, most of the prospecting in the north is done by larger companies, I believe; is that correct.

MR.PICKARD: I would think this is correct today.

MR. FEEHAN: I was wondering whether or not, suppose a railway were built in either place, would you think that these larger companies would change their base of operations to some other place along the railway? Let's say, for instance, that a company is now operating out of Yellowknife. Would they change their base of operations to, say, Fort Smith?

MR. PICKARD: Unlikely in the beginning.

MR. FEEHAN: And you wouldn't find very many prospectors jumping off the train at this point and heading out into this area.

MR.PICKARD: No, I don't think so.

MR. FEEHAN: Would you find many prospectors jumping out and heading into this area?

MR. PICKARD: No, I don't think so.



MR. FEEHAN: So, generally speaking, this area going across here wouldn't assist any company in their operations.

MR. PICKARD: Why do you say that?

MR. FEEHAN: I am saying that they would not change their base of operations.

MR. PICKARD: I agree with that, but in your final question you said something.

MR. FEEHAN: I said they would still operate from their old base. Would it not be true that it wouldn't matter whether the railway came along here or there as far as the larger companies doing preliminary work?

MR. PICKARD: I am not sure that that is correct. The reason I say that is this, that if you know that a railroad is going to go on the eastern route rather than on the western route, you will then take a long look at the area that is going to be closest to the railroad, won't you?

MR. FEEHAN: I am not an expert.

MR. PICKARD: You said that this would not be true, didn't you?

MR. FEEHAN: Well, let me put it this way. Do you feel that the railway traversing the area closer to the Pre-Cambrian Shield would be an assistance in your preliminary operations than the area south of the Great Slave Lake?

MR. PICKARD: I don't think it would be



an assistance, but I say that it would tend to make you feel that this area is a more attractive area for prospecting.

MR. FEEHAN: Isn't most of the prospecting done by aeroplane?

MR. PICKARD: Oh, it could be done by a tunnelling machine, but what you are going to mine by is normal methods and get it to a railway. This is not the only thing that influences your thoughts of where to prospect. This won't help your prospector, I agree with that, but it will influence definitely where you are going to prospect.

MR. FEEHAN: Your point being that you would hope to find a mine in an area which would be accessible to rail.

MR. PICKARD: Or that you would hope that the railway would be close to your area that you can find a mine.

MR. FEEHAN: How far is your mine from Yellowknife?

MR. PICKARD: Three or four miles.

MR. FEEHAN: Was there any kind of a road in there at the time the discovery was made?

MR. PICKARD: Not a thing.

MR. FEEHAN: And I suppose that the ore body was pretty well proven up before a road was built?

MR. PICKARD: Yes. I think there might have been a trail that an odd Indian traversed before



this, but most of it was done by boat.

MR. FEEHAN: But the decision was made after the ore was located.

MR. PICKARD: Yes.

MR. FEEHAN: And is this not a general rule in mining, that the body of ore is located and then the road is made?

MR. PICKARD: This is frequently true.

MR. FEEHAN: Would you think that is generally true?

MR. PICKARD: Well, let's think of International Nickel at Sudbury. The railway came through and then they found a mine, cobalt, and in the case of the iron, they found the mine and then the railway went to them. I can see both sides of this.

MR. FEEHAN: Would you think it likely that a mine would be found as a direct result of building this road here because it traverses that particular area?

MR. PICKARD: I can't guarantee anything like that.

MR. FEEHAN: I didn't ask you to guarantee it. I was wondering if you would feel it would be likely.

MR. PICKARD: Well, I don't - I would rather put it in a different way, that I would say the chances of finding a mine in the hundred odd miles adjacent to the eastern route would be better than the chances



of finding a mine in the hundred miles adjacent to the western route.

MR. FEEHAN: You are not worried about bulk shipments; your material comes out by the pound rather than the ton.

MR. PICKARD: Yes, this is true at the moment.

MR. FEEHAN: And it is not necessary to build a railway into your operations at the present time.

MR. PICKARD: At the present time.

MR. FEEHAN: Supposing you recovered a large base metal mine, then, of course, you would be greatly interested in a railway.

MR. PICKARD: Providing the freight rates are lower than they are at the moment, I would be.

MR. FEEHAN: Presuming it could be made economic, certainly you would agree that the railway would be the cheapest way of getting it out.

MR. PICKARD: I would like to see that on paper, but I assume this is correct.

MR. FEEHAN: Supposing the copper find near Port Radium were to become a large find, I would assume that sooner or later a railway would be built to that area if it were made economically feasible.

MR. PICKARD: Well, you have assumed that.

MR. FEEHAN: Would you agree?

MR. PICKARD: Well, I don't know. Again what I would do in a case like that - supposing your



deposit was large enough, I would feel reasonably sure that some day it is going to be mined. I think that it is a question of the economics of the situation.

MR. FEEHAN: And do you feel that constructing a railway to Pine Point, in doing that, in constructing that railway, one should very seriously consider what the next step in the extension of the railway will be?

MR. PICKARD: Would you repeat that, please?

MR. FEEHAN: Would you say that in the construction of a railway to Pine Point one should be very careful about what the next likely extension of the railway would be?

MR. PICKARD: Yes. I think this would be a most admirable thing, but I don't think you have the faintest idea where the next extension would go to.

MR. FEEHAN: A person should consider whether it would be easier to go to the west of the lake or to the east of the lake in the next extension.

MR. PICKARD: This sounds reasonable. I say, though, that I would like to remind you that you haven't the faintest idea where the next one is going to be, and if you definitely commit yourself to either the west or the east it might be that wrong by many hundreds of miles.

MR. FEEHAN: You have more than one mine operating north of the lake.



MR. PICKARD: No, just one. We have only one. You are referring to our own company?

MR. FEEHAN: Yes.

MR. PICKARD: No, we have only one.

MR. FEEHAN: There are several mines in the Yellowknife area?

MR. PICKARD: Yes.

MR. FEEHAN: And I imagine some of them now are without roads?

MR. PICKARD: Gad, you are right.

MR. FEEHAN: Mostly served by air, completely

MR. PICKARD: Some of them are practically served by aircraft.

MR. FEEHAN: Could it be said that, to some degree at least, the aircraft has eliminated the necessity for roads?

MR. PICKARD: Yes, I think this could be said, but you are getting awfully close to another factor now. Capital expenditure starts to crawl into the picture, and if you have a mine that is mining 50 tons a day you don't require a great volume of freight; if you have a mine that is mining 10,000 tons a day you do have a great volume of freight. At 10,000 tons a day you can afford to build a road; at 50 tons a day the cost of your road is going to be the same.

MR. FEEHAN: I was only trying to bring out the point that an ore body has to be found first



or should be found first and then the accessibility comes later.

MR. PICKARD: Like International Nickel. There the railway went through and then they found International Nickel.

COMMISSIONER THOMSON: Was that a question of mine, Mr. Feehan?

MR. FEEHAN: It was one of mine.

COMMISSIONER THOMSON: I had a question somewhat similar, but I think it said in a preliminary stage aircraft were used.

MR. PICKARD: I think in the north an aircraft is an essential thing in the preliminary stages.

MR. FEEHAN: I imagine that Giant Mines use aircraft in their work.

MR. PICKARD: Yes, this is correct.

MR. FEEHAN: And you have carried on your preliminary investigations with aircraft for several years.

MR. PICKARD: This is correct.

MR. FEEHAN: So the word "~~in~~accessibility" or "impossible" is not a word that a geologist uses; but would you say at the present time any area in the Pre Cambrian Shield is really inaccessible?

MR. PICKARD: Nothing is impossible today.

MR. FEEHAN: You look for the most likely place and you go one way or the other; is that about it?



MR. PICKARD: Yes, within reason, that is correct.

MR. FEEHAN: Has your company done exploratory work south of the lake in the Pre Cambrian Shield?

MR. PICKARD: This is correct.

MR. FEEHAN: And I don't suppose you have found any particular difficulty as to the accessibility of that area south of the lake, anymore so than any other area.

THE CHAIRMAN: I wonder if you would tell us what you are getting at, Mr. Feehan. Mr. Pickard has said you can get to any place very readily.

MR. FEEHAN: I am merely asking some questions which were submitted to me. I don't know exactly where they are going to lead.

MR. PICKARD: Are you asking a question now?

MR. FEEHAN: I would say that this area is no more inaccessible than any other area.

MR. PICKARD: Well, it is more inaccessible than the area around Edmonton.

MR. FEEHAN: I am thinking of the area to the north.

MR. PICKARD: Yes, you are probably right.

MR. FEEHAN: And your company hires prospectors for exploratory work.

MR. PICKARD: They have on occasion, yes.

MR. FEEHAN: And I imagine that most local



They hire on for major companies, don't they?

MR. PICKARD: I am not sure. I can't tell you the answer to that question.

MR. FEEHAN: Do you know whether or not there are many so-called freelancers operating in the north?

MR. PICKARD: There are a few. Again what do you call a prospector? I don't know if I can give an intelligent answer to that question. I don't think it is a very intelligent question.

MR. FEEHAN: I understand that Canadian Nickel Company spends large sums of money operating in the Pre Cambrian Shield.

MR. PICKARD: I think this is correct.

MR. FEEHAN: Do you know whether they are operating to the north or to the south of Great Slave Lake?

MR. PICKARD: I do.

MR. FEEHAN: Are you prepared to say?

MR. PICKARD: Yes, they are operating north.

MR. FEEHAN: Kennarctic Explorations are also operating.

MR. PICKARD: Yes.

MR. FEEHAN: Are they operating to the north or to the south?

MR. PICKARD: North.

MR. FEEHAN: And Eldorado Mines.

MR. PICKARD: Yes.

MR. FEEHAN: I understand also that Canadian



Explorers and Northland, Goldcrest and McEvoy and American Metals and a great many others are operating and all of them to the north of Great Slave Lake.

MR. PICKARD: This may well be true.

MR. FEEHAN: Do you know if any of the ones I have mentioned are operating to the south?

MR. PICKARD: I don't know of a soul who is operating to the south. Many of them have in the past.

MR. FEEHAN: Do you know of any reason why all of these major companies are operating to the north and you know of no-one operating to the south?

MR. PICKARD: Possibly because it is not a fashionable area at the moment.

MR. FEEHAN: Would you explain what that means?

MR. PICKARD: Prospecting tends to go in cycles; one area might be popular. I don't know why they are all operating there. I suppose at the moment they feel that this is the best bet for it.

MR. FEEHAN: At the moment they feel that this is the best area to find an ore body, north of the lake.

MR. PICKARD: At the moment.

MR. FEEHAN: There is a road presently from Yellowknife to Fort Rae.

MR. PICKARD: I think it is completed, yes.

MR. FEEHAN: Do you know if any particular



road resulted in any particular prospecting?

MR. PICKARD: I noticed some staked claims. I think they were done after the road was put there, but I don't know that definitely.

MR. FEEHAN: You don't think that the major companies moved into that area because there is a road.

MR. PICKARD: This is correct.

MR. FEEHAN: And, generally speaking, a road to the east from Yellowknife wouldn't make the major companies work any more in that particular area.

MR. PICKARD: This may or may not be true.

MR. FEEHAN: Is there a prominent fault running approximately north-south in the vicinity of the boundary of Yellowknife?

MR. PICKARD: There is.

MR. FEEHAN: Do you know the name of it?

MR. PICKARD: The West Bay Fault.

MR. FEEHAN: And your company, I suppose, has prospected that Fault pretty thoroughly.

MR. PICKARD: I think we looked at it once, yes.

MR. FEEHAN: Do you know whether or not you have examined fairly carefully the strip 20 miles west of the West Bay Fault?

MR. PICKARD: What was that?

MR. FEEHAN: Do you know whether or not your company has paid more attention 20 miles west of the Fault rather than 20 miles east of the Fault?



MR. PICKARD: 20 miles?

MR. FEEHAN: I am just using that as a figure.

MR. PICKARD: Well, Consolidated holds most of the ground we are particular - would you repeat that question? I just can't quite recall what you said again.

MR. FEEHAN: The question was: have you prospected that strip of the country, say, 20 miles wide lying to the west of the West Bay Fault as thoroughly as you have that area lying to the east of the West Bay Fault?

MR. PICKARD: We have spent more time east of the West Bay Fault; Con has spent more time west of the West Bay Fault.

MR. FEEHAN: I notice the area to the west shows up as being largely granite.

MR. PICKARD: It depends where you look at it.

MR. FEEHAN: On the map itself.

MR. PICKARD: That is right. On this side, all you can see as a favourable area is west of the West Bay Fault.

COMMISSIONER THOMSON: The question was meant to include this section from here to here. Comparing these two sections here, has this area been prospected as much as this?

MR. PICKARD: No.

COMMISSIONER THOMSON: The next question



was: Why?

MR. PICKARD: Because these sediments have been shown to contain more gold here than these granites have.

MR. FEEHAN: The road across to Fort Rae traverses most of the granite area to the west of that Fault; isn't that true? - the road to Fort Rae.

MR. PICKARD: Yes, this is correct.

MR. FEEHAN: And is that also probably one of the reasons why prospecting hasn't increased in that area, because it is granite?

MR. PICKARD: This is probably right. I think it is probably a type of granite that you probably won't find too much of.

MR. FEEHAN: Let's say that, instead of a road to Fort Rae, we had a railway to Fort Rae, would that increase the prospecting, do you think, between Yellowknife and Fort Rae?

MR. PICKARD: Not necessarily.

MR. FEEHAN: And the reason being, of course, as you have said, that because it is largely granite.

MR. PICKARD: This is correct.

MR. FEEHAN: The Town of Yellowknife is more or less considered as a company town; most of the employees or a great number of the employees work at the mine, the Giant Mine and the Con Mine.

MR. PICKARD: No, I wouldn't say that it is considered as being a company town.



MR. FEEHAN: Let's say that a great many of the employees of Giant and Con live in Yellowknife.

MR. PICKARD: I would agree with that.

MR. FEEHAN: Would a person who worked in those mines be free to engage in private exploration for themselves?

MR. PICKARD: Well, I tend to frown on it, but some of them do it.

MR. FEEHAN: Is the town of Yellowknife a company town inasmuch as it is owned by a mining company?

MR. PICKARD: No.

MR. FEEHAN: Are the residents free to engage in any private enterprise which they hope will be profitable to themselves and of benefit to the community?

MR. PICKARD: I would say they can.

MR. FEEHAN: Would cheaper freight rates and general improvement in transportation facilities help these enterprises?

MR. PICKARD: Which enterprises do these refer to?

MR. FEEHAN: Perhaps Mr. Thomson can explain that.

COMMISSIONER THOMSON: Well, the first question was: Are the residents free to engage in any private enterprise which they hope will be profitable to themselves and of benefit to the community,



that is people not engaged at the mines? The next question was: Would cheaper freight rates and general improvement in transportation facilities help these enterprises?

MR. PICKARD: These enterprisers being truckers, and so on?

COMMISSIONER THOMSON: Yes.

MR. PICKARD: Yes.

COMMISSIONER THOMSON: Any help that these enterprises would get would apply to such communities, Hay River, Fort Simpson, Aklavik or any community in the Slave Lake-Mackenzie River area.

MR. PICKARD: I don't know if that is necessarily true. You said that anything that would help Yellowknife would help the other places. I would refer, for example, to where we obtained a reduction to Yellowknife in freight rates which didn't help anyone in the north; it helped only Yellowknife.

COMMISSIONER THOMSON: Does the fact that Great Slave Lake is frozen over from November to June add materially to the cost of operations in the Great Slave Lake-Mackenzie River area, both the mines and other enterprises?

MR. PICKARD: Well, you certainly have your interest costs and your warehouse costs.



I would suppose if the lake was open the year round you would be able to get -- Northern Transportation might be able to operate more efficiently if they did not have peak periods and then nothing.

COMMISSIONER THOMSON: I was wondering, would it add considerably to the cost of freight rates or would it not be too ---

MR. PICKARD: I have difficulty in saying. I do not know just how much it would affect it.

COMMISSIONER THOMSON: Well, has there been any new development mine-wise, or any other-wise, in the last two or three years that has changed the transportation problem in the country? Are there any new developments since 1957 that have radically changed the transportation setup, that you can think of?

MR. PICKARD: Well -- what would have happened in the last few years?

COMMISSIONER THOMSON: I do not know, but I was wondering if you did.

MR. PICKARD: We have had reduced freight rates. Is this the sort of thing you are thinking of?

COMMISSIONER THOMSON: No, I was wondering if there were any new mines, or anything has happened that would make it more urgent to get a railway in to any place either on the west or east route. I mean, has there been anything developed over the last



couple or three years that has made the building of a railroad different or more difficult? I mean, has there anything very startling happened in the country in the last couple of years mine-wise, or in industry, or anything like that? There has not been anything since Pine Point; that is as far as I know.

MR. PICKARD: The only thing I can think of would be possibilities, and, again, it is just rumour -- I have not seen this firsthand. I understand that INCO has some sort of an interesting structure that they are drilling on up in this general area.

COMMISSIONER THOMSON: Well, I wanted to quote something here. The Edmonton Chamber of Commerce sponsored a Northern Development conference in 1957, and I believe some of our prominent Yellowknife men were there. They drew up this resolution, this was on May 1st, 1957, just a little over two years ago, and one of the resolutions was:

" Athabasca-Slave-Mackenzie Water
System

"Whereas progress has been made in providing aids to navigation on the Athabasca-Slave-Mackenzie Water System;

And Whereas water transportation will have increasing importance in Northern development;

Now, therefore, be it resolved that the programme for providing aids to navigation on the Athabasca-Slave-Mackenzie Water



System be extended and accelerated."

The second resolution was respecting a railway to Great Slave Lake, and the resolution reads:

"Whereas the construction of a rail line from Grimshaw, Alberta, to the south shore of Great Slave Lake is now essential to the development of Northern Alberta and the Mackenzie District of the Northwest Territories and the exploitation of mineral resources for the general benefit of the economy of Canada;

"Now, be it resolved that a final survey of the route be undertaken immediately and construction of the railway be commenced promptly;

"And be it further resolved that the Federal Government be urged to come to and announce its decision to proceed with such construction in order that mining and industrial development can proceed."

As I say, the Northern Development Conference sponsored by the Edmonton Chamber of Commerce was in 1957. You have not heard of any new developments that might have materially altered the situation since 1957?

MR. PICKARD: You have got me, John.
What do you want me to say?

COMMISSIONER THOMSON: I do not want you to



say anything.

MR. PICKARD: Very well.

COMMISSIONER THOMSON: I was not asking a question, I was merely making a statement.

THE CHAIRMAN: Is that all the questions, Mr. Thomson?

COMMISSIONER THOMSON: Yes.

THE CHAIRMAN: Mr. Feehan?

MR. FEEHAN: Nothing further.

COMMISSIONER GAINER: I have one question. This may not be fair on such short notice, but I am interested in the location of where you might draw your mining supplies as to whether or not it is particularly a long rail haul or that a fairly high proportion comes from points Edmonton and north, and this would make certain differences to the freight rate structure. Would you be able to give us some idea of what proportion of your supplies move ---

MR. PICKARD: As I recall, and I may be well off, we move in oil from Fort Norman, all our oil comes by barge from Fort Norman.

COMMISSIONER GAINER: All types, fuel oil as well as ---

MR. PICKARD: We normally only use one kind of oil, Bunker C oil.

COMMISSIONER GAINER: And that all comes from Norman Wells?



MR. PICKARD: All from Norman Wells. Between a million and a million and a half gallons a year. The same thing applies to Con Mine; all their oil is Bunker C oil that comes from Norman Wells. Our lumber all comes from the Fort Smith area by barge from Fort Smith.

COMMISSIONER GAINER: Before we move on, with regard to petroleum products, your Bunker C fuel you store; you bring in nothing in the winter?

MR. PICKARD: This is right.

COMMISSIONER GAINER: You store an adequate supply in the summer?

MR. PICKARD: Yes. Our lumber we bring from Fort Smith by barge. Now, those are the two largest items apart from general freight. As I remember it, we have about 3,000 tons of general freight that comes in from Edmonton. Is this the sort of thing you wanted to know?

COMMISSIONER GAINER: Yes. As far as materials, chemicals, and so on, you would say that in a very large proportion, once you are in operation, quite a very large proportion moves in under longer rail hauls, let us say, from the United States or Canada. Most of it is derived from points not much different than Edmonton?

MR. PICKARD: Well, our big items are steel balls, plate, dynamite, chemical reagents. They are probably our weightiest items.



COMMISSIONER GAINER: You get steel balls, or could, from the Edmonton area now?

MR. PICKARD: We could. We are experimenting with some Edmonton balls at the moment. We have brought them from the east in the past. We buy most of our plate locally; most of our powder comes from southern Alberta, and this is a large item. Chemicals come from far and wide.

COMMISSIONER GAINER: Well, this is the kind of thing I was interested in generally, and I know it would vary from one operation to another, but during construction there would be a higher proportion drawn from more distant points, I would presume. Is that correct? During the construction of putting a mine into operation?

MR. PICKARD: Yes, I would think that is probably correct.

THE CHAIRMAN: Mr. Pickard, I missed one of the things you said. I did not get a note of it. You spoke of the petroleum products that come from Norman Wells to Yellowknife?

MR. PICKARD: Yes.

THE CHAIRMAN: Would you mind telling me what it is?

MR. PICKARD: Bunker C; it is fuel oil for our boilers and we use it in our industrial processes.

THE CHAIRMAN: Do you know how much comes to the Yellowknife area from Norman Wells?



MR. PICKARD: Oh, it must be -- I would think at least a million to a million and a half gallons. As I remember it, we get about a million to one and a half ourselves in that period, depending on whether we are running one process or not. I think this year is an odd running year and we are on a million gallons. I think Con would use about half as much as we do.

THE CHAIRMAN: Do you know how many tons that is?

MR. PICKARD: About seven pounds to the gallon.

THE CHAIRMAN: In the neighbourhood of 5000 pounds?

MR. PICKARD: Yes.

COMMISSIONER GAINER: While we are on that subject, are you under the impression that the Norman Wells operation is capable of supplying the whole of the need -- let me put it the other way -- what is the explanation for the fact that so much by way of petroleum products does move in from the south?

MR. PICKARD: Well, I think you will find, and I do not know what moves in from the south, but I think you will find that what is moving in from the south is probably a higher grade fuel oil for stoves and that sort of thing. Bunker C is at the bottom of the barrel; when everything is taken out what is left is called Bunker C.

COMMISSIONER GAINER: I was under the



impression that Norman Wells was able to meet the ---

MR. PICKARD: It is the best Bunker C in the country, and it is running out of their ears, they do not know what to do with it. This is what I have heard, but perhaps you should ask Imperial Oil.

THE CHAIRMAN: What about other petroleum products for Yellowknife; do they come from Norman Wells as well?

MR. PICKARD: Such as?

THE CHAIRMAN: Gasoline.

MR. PICKARD: I must admit I do not know about gasoline. I would think probably it would come from the south, but I am not absolutely sure of that.

THE CHAIRMAN: Is there any diesel fuel?

MR. PICKARD: Not too much at the moment.

THE CHAIRMAN: This Bunker C oil, that is the major part of the petroleum products that goes into that area, is it?

MR. PICKARD: Yes, apart from what is used for household heating in the Yellowknife area.

THE CHAIRMAN: And for household heating?

MR. PICKARD: They would use a higher grade fuel oil.

THE CHAIRMAN: Is that not available from Norman Wells?

MR. PICKARD: Again I am not sure whether it comes from Norman Wells or from the south.

THE CHAIRMAN: Do you know about how many



tons of lumber you get from Fort Smith per year?

MR. PICKARD: We used to get about a million board feet a year and thousand board feet weighs about 35 pounds. During recent years we have not been consuming that much -- I would think 500,000 board feet.

THE CHAIRMAN: Would you like to adjourn now, Mr. Bishop, and discuss the evidence that Mr. Pickard has given with your associates because you may have some questions you would like to ask?

MR. BISHOP: I think we would, sir. I do not have many notes myself, but Mr. Pearce may have some questions.

THE CHAIRMAN: Well, suppose we take a five-minute adjournment and you can find out how long you are likely to be this afternoon, and then we will decide whether to adjourn until one-thirty or two o'clock.

MR. BISHOP: Very well.

---Short recess.

THE CHAIRMAN: Do you think you will be very long after lunch?

MR. BISHOP: I do not think so. I have about six questions.

THE CHAIRMAN: You do not mind being here from, say, two o'clock to three o'clock this afternoon, Mr. Pickard?

MR. PICKARD: No, not if it will take that



long.

MR. BISHOP: I am sure this will not take any more than fifteen minutes unless our questions raise some more questions in the Commission's minds.

THE CHAIRMAN: Very well, we will adjourn now until two o'clock.

---Luncheon adjournment.



--- On resuming at 2 p.m.

THE CHAIRMAN: Are you ready to go on now, Mr. Bishop?

MR. BISHOP: I was wondering, Mr. Chairman, whether we might depart slightly from the usual procedure and let me ask a question or two. I don't think there is anything controversial, but it is a little hard to explain what we have in mind to Mr. Feehan.

THE CHAIRMAN: If you don't mind, I would like to ask a question or two apropos some of the things we were discussing this morning.

We were talking about the road this morning, I think, Mr. Pickard, from Fort Rae to Yellowknife, and I think you were asked if any exploration or prospecting has been done along the side of that road. That is purely an access road, isn't it?

MR. PICKARD: This is part of the road system between the south and Yellowknife. The purpose of this road is primarily to get to Yellowknife.

THE CHAIRMAN: There was never any thought that that road would be a road which would encourage prospecting.

MR. PICKARD: Well, this certainly wasn't the primary object of the road, I know.

THE CHAIRMAN: There is no reason why any prospecting should be done in the immediate vicinity of the road.



MR. PICKARD: No; it wasn't put in for that purpose.

THE CHAIRMAN: And apropos mines being found and then access being found to the mines, would you say that the building of a railroad into Great Slave Lake will encourage exploration in the Northwest Territories for minerals?

MR. PICKARD: Would you mind repeating that question?

THE CHAIRMAN: There is perhaps some doubt raised by some of the things you said this morning. If this railroad were built to near the south shore of Great Slave Lake somewhere, would you say that this would encourage exploration in the Northwest Territories?

MR. PICKARD: Yes, I would say this, providing always that the freight rates which result from such an installation are substantially lower than they are today, and I assume this will be the case.

THE CHAIRMAN: If concentrates can be brought out by railway at a considerably less cost than they could be brought out by trucks.

MR. PICKARD: Yes, or any current method of transportation.

THE CHAIRMAN: It would be a big event.

MR. PICKARD: Well, I would say you could be interested in deposits which you otherwise wouldn't consider, from an economic standpoint.



THE CHAIRMAN: And would you say that it would promote a search for mineral deposits beyond the search which is being made now?

MR. PICKARD: This is possible or probable; but frequently deposits are found under current conditions which exist today which are not economical and they are perhaps disregarded - found and drilled and then forgotten. If the rates are lower, obviously these deposits would be put into operation, providing that the economics were there.

THE CHAIRMAN: Would it be fair to put it somewhat like this, that if the freight rates for bringing concentrates out of the north are considerably lower, it means that there would be many more properties which would be worth developing than if the rates stayed at their present high rate?

MR. PICKARD: Yes, that is correct, providing the deposits are found.

THE CHAIRMAN: And because more deposits could be developed with ore freight rates, it would follow, would it not, that there would be a more intensive search because there is a better prospect of a prospector finding something that would be economic.

MR. PICKARD: This is statistically correct.

THE CHAIRMAN: That is all I want to ask.
Thank you very much.



MR. BISHOP: Mr. Chairman, before I ask any questions, I would like to introduce to the Commission Mr. Charles Hames who is with us today. Mr. Hames - I think this is right - is Assistant Manager in charge of production at Sherritt-Gordon, and he is here with Mr. Pearce. It occurred to me that he might have some thoughts in connection with some questions and answers.

MR. PICKARD: Referring to certain things that were said this morning, one question was concerning possible competition for the smelting, for the custom smelting of ore, and it was suggested that there is a possibility that the position of the mine operator might be improved if it were possible to send ore to the Grimshaw area, probably Fort St. John, or wherever a custom smelter might be built there, or to Trail or to Edmonton. Now, might not the same competition be as likely or as possible by the same creation of smelters, say, an additional smelter at Edmonton or an additional smelter at Calgary or an additional custom smelter wherever there happens to be reasonably cheap power and fossil fuels?

MR. PICKARD: This is correct.

MR. BISHOP: What I am trying to establish is the point that the smelter in the Peace River area is still merely a possibility, suggested as a possibility, and the same possibility would exist at other places and still give the competition referred to.



MR. PICKARD: This is correct, providing always that the combination of freight, energy and raw materials are much the same in one area as in another. You have to consider this as a combination; you cannot consider any one of them individually. But if this combination exists anywhere, then presumably smelter charges will be approximately the same.

MR. BISHOP: So that the competition could conceivably arise in numerous sets of circumstances.

MR. PICKARD: It might be in Timbuctoo

COMMISSIONER GAINER: May I just interject for a minute, Mr. Bishop?

Would it not be true to say that the competitive alternative might even today, on the basis of existing smelter locations, being greater, if you had access through to the West Coast as well as access to the existing central markets, having in mind Tacoma and California locations?

MR. PICKARD: Again I feel it is almost impossible to give an off-hand answer to this unless you have a specific case. The combinations of these various items have to be considered in detail before you can really come up with too sensible an answer to it.

MR. BISHOP: I think that covers my point, Mr. Chairman. I merely wanted to establish, if possible, that he did not feel that automatically the



presence of a, shall we say, a power complex in the Peace River area would create more competition than the other route.

Now, referring to a phrase that you used this morning, Mr. Pickard, the currently fashionable areas for exploration - -

MR. PICKARD: Careless use of words.

MR. BISHOP: Yes, I appreciate that. Has it not been historically true that certain areas tend to be explored, both for mining and for oil and gas, over certain periods of two or three years, maybe very intensively, and maybe certain other areas are neglected or even generally admitted to be worthless, and that these conditions change again in subsequent periods?

MR. PICKARD: I would say this is true to a certain extent, yes. It is very difficult to determine to what extent, but this certainly does happen. I am trying to think of a currently fashionable mineral, and I can't think of one. But there have been periods when lead and zinc have been all the rage. Next year lead and zinc may not be all the rage. The same applies to nickel, which has a glamorous history; it still has a glamorous history, but it is in fashion to very varying degrees.

MR. BISHOP: Now, this morning you were discussing **very** briefly the costs of inventory which resulted from lack of all-year-round transportation.



I think you mentioned the cost of warehousing and the interest charges. Would you say that it is an important factor in the case of these necessary inventories the uncertainty as to the total amount of inventory you are liable to need in the sense that you must stock up for the longest winter and the worst winter even though this might not turn out to be necessary, which means that more money would be tied up which would otherwise be spent for the items inventoried?

MR. PICKARD: A person tends to order a little more than you actually require. The greater danger is where the first person at the bottom of the line adds something, and the next person adds a little more. Perhaps when it comes to me I say that this is pretty pathetic and I add a little more, and you end up with enough to last you two or three years of any particular item. This is a true cost.

MR. BISHOP: Would you say that this was noticeably more of a factor in the days before the highway had been built to Hay River so that there was no emergency? In other words, there was no winter road in the Yellowknife area now, and if you did guess wrong in your inventories in certain things you can at least pay the extra cost and get them in. Has your experience with Giant been going on long enough for you to be able to tell us whether the situation was more costly when you did not have this emergency service?



MR. PICKARD: Yes. Unfortunately it is a combination of things; it is a combination of experience in the fact that the road is there, and I am not sure what you attribute to what. You could attribute part of it to more experience, you could attribute part of it to the road. But in recent time our inventory has decreased, in spite of the fact that we are milling more ore than we did before.

MR. BISHOP: The reason I asked this question was that at the present time Yellowknife does pay this emergency winter road service, but Uranium City pretty well has to stock-pile everything for the water route, and I am wondering if you can evaluate for us whether it would be valuable to Uranium City to get things in on an emergency basis.

MR. PICKARD: I find it impossible to put a figure on that. I think it would be a benefit, but - -

MR. BISHOP: You couldn't say whether it would be large or small.

MR. PICKARD: No.

COMMISSIONER GAINER: Have you any idea how much freight you bring in over the winter road at the moment?

MR. PICKARD: I should have this at my fingertips, but I don't. The normal thing is something in the order of 3,000 tons; I would guess that during the winter we might bring a hundred to three



hundred tons.

COMMISSIONER GAINER: What do you figure your stock-pile period. Let's say for general supplies, lumber, petroleum?

MR. PICKARD: What you try to do is this: you get orders, say, this coming February for the following year, and what you aim to do is to have by the end of the shipping season, this is October, ten months' supply on hand, so you order in February with the objective of having at the 1st of October ten months' supply of raw materials on hand at that time. That will take you through to the end of July the next year. This gives you a month's safety factor on the other end.

COMMISSIONER BISHOP: Does it ever cause problems, the fact that you are, in effect, at the outside edge ordering materials which you will not use for fifteen months?

MR. PICKARD: Just what - -

MR. BISHOP: You say you order in February with a view to laying in a supply of materials, the last of which is intended to be used in the end of the following July or June.

MR. PICKARD: Yes.

MR. BISHOP: Would it be any material benefit or advantage to be able to order as you needed?

MR. PICKARD: Oh, definitely.

MR. BISHOP: Not only from the point of view of interest, but from the point of view of not having



to make decisions.

MR. PICKARD: Decisions, decisions, decisions. I don't know - you come to a conclusion on this and you hope you are right. Frequently you are not right. I think it would be much easier if you could do it on a month to month basis.

MR. BISHOP: It would be easier to be right, more often.

MR. PICKARD: Yes, more often. Of course, you could be wrong the first time and you would be wrong all along.

MR. BISHOP: Mr. Pickard, have there been, to your knowledge, any recent changes in the trucking rates to Yellowknife as the highways have improved?

MR. PICKARD: I am not sure if there have been any. Trucking rates are continually changing on certain classes of freight, but I have been advised by several trucking firms that when the road is completed they are prepared to revise their rates considerably. They have even given me a schedule of these rates. Again I can't recall them off-hand.

MR. BISHOP: Do the materials you receive come from a number of different trucking firms?

MR. PICKARD: At the moment there is only one trucking firm running into Yellowknife, but when the road is completed I feel reasonably sure there will be more. I don't know this, but I feel reasonably sure there will be more.



MR. BISHOP: Can you tell us roughly how much cyanide and how much lime you import and where it comes from?

MR. PICKARD: I should know that. As I recall it, we buy our lime through some local organization - by local, I mean Edmonton. Where they buy it from I am not quite sure, but I think they purchase - I imagine that they purchase it locally, within Alberta, perhaps. They always seem to be able to quote lower than anyone else that we hear from. Our cyanide largely comes from - I am not just too sure which firm we buy it from. I am sure, but I better not say anything.

MR. BISHOP: Before you ask Mr. Pearce for any information, I should say that the question comes from Mr. Pearce.



MR. PICKARD: I will cheerfully write you a letter and give you that information, but I cannot give it to you sufficiently accurately now.

MR. BISHOP: Can you tell us how it comes? Is this something you bring in in the summer?

MR. PICKARD: Oh, yes. These are in the order of hundreds of tons. I would say at least a hundred tons of each, but it may well be much more than this -- it could be 200 tons.

MR. BISHOP: Well, that would come in by barge from Waterways?

MR. PICKARD: This is correct.

MR. BISHOP: I think those are all the questions I have, Mr. Chairman. I do not know whether the two gentlemen from Sherritt-Gordon may think of something they would like to ask.

THE CHAIRMAN: Mr. Pickard, you have said, I think, that you now bring in something in the order of three thousand tons of freight over a twelve-month period?

MR. PICKARD: This is true.

THE CHAIRMAN: And of that from 100 to 300 tons comes in over the winter road?

MR. PICKARD: I would think these figures are of this order.

THE CHAIRMAN: Has there been much increase in the amount of freight you bring in over the winter roads?



MR. PICKARD: I am sorry?

THE CHAIRMAN: Has there been much increase in the amount you bring in over the winter road since the winter road was built?

MR. PICKARD: Oh, yes.

THE CHAIRMAN: I am sorry, have you brought in more freight since the winter road was built than you did before that time?

MR. PICKARD: This is true. I am sorry I have not these figures with me.

THE CHAIRMAN: Can you give us any idea as to what the change has been?

MR. PICKARD: No. What we do, we tend to do, we tend to move the high-cost, low-weight items in in the winter time by truck. This is high-value per pound of material, and then your freight costs do not have so much of a percentage influence on the cost of that item. Does that make sense?

THE CHAIRMAN: I think I understand it.

MR. PICKARD: So you have 20 cents a pound; if your pound is worth 20 cents you double your -- if it is worth \$100 you are raising that only to \$100.20, which is insignificant.

THE CHAIRMAN: How long is it since you have had a winter road coming into Yellowknife around the lake?

MR. PICKARD: About three or four years --



four years perhaps. The first year not too much came over it.

THE CHAIRMAN: Would it be convenient for you to write and let us know?

MR. PICKARD: I will do this.

THE CHAIRMAN: What these figures are?

MR. PICKARD: I will do this.

THE CHAIRMAN: I think we will be interested in knowing what your freight is in round figures.

MR. PICKARD: You would be able to get some good figures on this from Hamilton, the trucker from Grimshaw. He would have the tonnage he brought in during recent years compared to the earlier years.

THE CHAIRMAN: I suppose the time before the winter road was built you took your freight in by air?

MR. PICKARD: And tractor train, yes.

THE CHAIRMAN: Across the lake?

MR. PICKARD: Yes.

THE CHAIRMAN: Would he have those figures?

MR. PICKARD: It is possible he would have a pretty sharp idea of them.

THE CHAIRMAN: If you have them readily available we would be very glad to get them from you. That is, what you got as a total tonnage per year, and how much of it came in by winter road, by air and by tractor train.

MR. PICKARD: I make a summary of this every



year, so I will send you a copy of the earlier summary.

THE CHAIRMAN: There are a couple of other questions I would like to ask you. Are there in the Northwest Territories any, or many, properties that you might call marginal? I am thinking of base metal properties where it is known there is some ore and which might be brought into production if the freight rate for concentrates was reduced enough?

MR. PICKARD: I think there is a possibility there. I am not absolutely sure of that, though.

THE CHAIRMAN: If the Pine Point mine is put into operation it will be a big base metal operation, will it not?

MR. PICKARD: Yes.

THE CHAIRMAN: And I suppose that will take into the North Country people who will be engaged in the operation and who might occasionally change employment?

MR. PICKARD: This is true.

THE CHAIRMAN: I am wondering if that is something which might perhaps encourage the opening of other base metal properties in that area?

MR. PICKARD: This might be true. It might also have the reverse effect. When you open up maybe some of our happy employees might want a change of scene and go down to Pine Point. When the uranium mines opened in Ontario in one quiet Sunday afternoon we lost half our mill employees, and I am rather



afraid that the same thing might be true when the nickel mine opens up next spring.

THE CHAIRMAN: It was suggested to us the other day that when you have one industry developing in one place you get substantial industries developing. I think Mr. Pearce explained that to us. That is not quite the situation I was thinking of up here, but I was wondering with the opening of the Pine Point base metal mine that that might encourage a little more interest in base metal development in that area to the point where you could hope for a better chance for other base metal properties being brought into operation.

MR. PICKARD: Well, I think this, as an area opens up to mining frequently others tend to look in the area or nearby areas with a greater intensity than they did before. Frequently areas near will establish mines because they are the best prospect. Does that answer your question? I am not sure that it does.

THE CHAIRMAN: Yes, thank you. Are there any other questions?

MR. BISHOP: I would like to ask a further question, if I may. Mr. Pickard, you are familiar, no doubt, with the announced development road programme that the federal government announced earlier. You can see some of them on this large map which is No. 2 on the wall. There is one from



Fort Smith around the east end, the northeast arm of the lake, and a further one going north from what we might call the junction that goes up the Coppermine or down the Coppermine. Mr. Thomson heard an announcement on the radio this morning that some of this programme has been changed. Am I misquoting you on that?

COMMISSIONER THOMSON: You are misquoting me entirely.

MR. BISHOP: It was suggested before lunch by somebody that there had been a change or a stretch-out in this area. We bought a Journal at noon and did not find any statement about it, but for the purpose of my question, assuming that the programme goes ahead as originally announced, would you feel that any mines found adjacent to that road north of the junction could be developed by trucking ore down the development road and around Fort Smith? If so, would you feel that an all year round operation around by Fort Smith would be a substantial advantage over an operation around the other way, which would be faced with the crossing of the Mackenzie River at Fort Providence?

MR. PICKARD: I doubt if there would be any substantial advantage to either route.

MR. BISHOP: In other words, would you feel whatever is the shortest distance from any given property would be the most advantageous way?



MR. PICKARD: I would rather rephrase it. You say that the most economical transportation route would be the one that you should choose, but I have difficulty in -- I do not think it is possible to answer that in an offhand manner.

MR. BISHOP: Do you think in the case of a base metal property that either route is practical?

MR. PICKARD: This is almost an impossible question to answer.

MR. BISHOP: That would depend in ---

MR. PICKARD: Entirely on what the ultimate freight rate was. It would depend on if you smelt it at the property -- there are so many factors to consider that it makes it very difficult.

MR. BISHOP: I think that is all I have to say, Mr. Chairman.

THE CHAIRMAN: Thank you very much, It was very kind of you to stay over today and give us your help.

MR. PICKARD: I have enjoyed every minute of it.

THE CHAIRMAN: I think we will adjourn for a few minutes.

---Short recess.

THE CHAIRMAN: Well, Mr. Pearce, we will go on with you if you do not mind.

MR. PEARCE: Yes, sir.



THE CHAIRMAN: Have you any questions, Mr. Gainer?

COMMISSIONER GAINER: Not at the moment.

THE CHAIRMAN: Mr. Pearce, most of the questions I want to ask you have already been answered, but I would like to ask one or two things. I think you told us that at your refinery -- is it correct to speak of your plant as a refinery -- it is both a smelter and refinery?

MR. PEARCE: No, it is a refinery.

THE CHAIRMAN: But you do work that is normally done by both smelter and refiner?

MR. PEARCE: That is right.

THE CHAIRMAN: And you bring in concentrates that are 12 per cent nickel?

MR. PEARCE: Yes.

THE CHAIRMAN: And that is as high as they are?

MR. PEARCE: Yes.

THE CHAIRMAN: And the treatment you give them makes it a 100 per cent nickel product?

MR. PEARCE: That is right.

THE CHAIRMAN: I think you told us the other day that you did not know what the freight rates are on these concentrates?

MR. PEARCE: I have a number of freight rates today which I can give you. May I ask for your indulgence? I have a few notes here and these freight



rates sort of logically fit into the way I was going to present this information this afternoon.

THE CHAIRMAN: Did you have something that you would like to tell us this afternoon?

MR. PEARCE: I have quite a number of things.

THE CHAIRMAN: By all means go ahead as you intended to and if there is anything that crops up we may interrupt you.

MR. PEARCE: If we may do it that way we will certainly appreciate it.

-

-

-

-

-



If, at the start, I make a few corrections in the transcript from Friday. These are particularly technical terms which are not quite correct in the transcript.

On page 2313, at the very bottom line, it talks about "copper sulphate". The word is "sulphide".

On page 2314, the opposite. The words in the fourth line from the bottom are "ammonium sulphide", and it should be "ammonium sulphate".

On page 2321, near the bottom of the second paragraph, there is a reference to "maintenance jobs". This is my fault for not speaking more correctly. It should be "maintenance shops".

On page 2334 and also on page 2335 in several places there is a reference to "blistered copper". The technical term is "blister copper" - B-L-I-S-T-E-R.

Also at the bottom of page 2335 the transcript is correct in which I am quoted as saying that we use no electricity at all. I should like to amplify that statement. We do not do any electrolytic refining, and it was in that sense that I used the term. We, of course, electricity for driving pumps and motors and lighting, and so forth, but this is a relatively small amount of the total costs involved in refining.

On page 2336, the fourth line from the bottom, the transcript says "bleaching" and the word is "leaching" - without the "b".



Mr. Chairman, you brought up just now a comparison between our refinery at Fort Saskatchewan and existing smelters and refineries, and I would like to dwell just for a minute on that point.

The process in use at Fort Saskatchewan is generally termed pressure hydrometallurgy, and it involves conducting reactions in a water medium, but under pressure. If I may use a very homely analogy here, it bears the same relation to normal treatment as, for instance, a pressure cooker in your wife's kitchen does to an open saucepan. Following that a little bit, you can cook, for instance, a tough piece of beef in an open pot and if you cook it long enough it will become fit to eat. Pressure hydrometallurgy is a little more complicated than that; not only does it do it more quickly and economically but in many cases it does things which you could not do if you operated in open vessels. This is a new development. It has been brought to perfection over the last ten years, and our refinery was the first of several to go into the full commercial operation. We believe that this process has been proven in our own refinery over the last five years. We think that it represents a significant step forward in the treatment of base metals.

A few years ago an organization in eastern Canada was proposing to put up a small custom refinery for nickel. They engaged consulting metallurgists to examine this problem and to report



to them what method would be most suited to their particular circumstances. I don't want to go into the full details; I haven't got his report available. But, in brief, he said that for a relatively small refinery, say, with a production of less than 80 million pounds of nickel a year - and this, incidentally is roughly three times the size of our own - the best method would be to use the pressure hydrometallurgy approach; in other words, the Sherritt-Gordon approach. If you were going to make a very large refinery, with a production of, say, 300 million pounds a year of nickel, then probably - and he emphasized the "probably" - you would use conventional smelting and electrolytic refining, and between the 300 million and 800 million - well, local circumstances would dictate it.

It is worth noting that there is in existence in Fredericton, Missouri - -

THE CHAIRMAN: You are dealing now with nickel?

MR. PEARCE: Yes.

THE CHAIRMAN: Does the same sort of thing apply to all other metals as well as base metals?

MR. PEARCE: I don't think we can state that. I don't think we are that far forward to say that, although, coming to Professor Forward's process

- -

THE CHAIRMAN: Does he deal with the same process - hydrometallurgy?



MR. PEARCE: Yes. At Fredericton in Missouri, the National Lead Company are operating a pressure hydrometallurgy refinery very similar to our own for the production of nickel, copper and cobalt, and the latest refinery being built in the world today, which is the Freeport nickel refinery in Louisiana, to produce 50 million pounds a year of nickel and about 5 million pounds a year of cobalt, is a licensee of ours and is going to use our process on a royalty basis.

THE CHAIRMAN: You have patented this process?

MR. PEARCE: Yes, this process has been patented. A great many patents cover this process, and these are being improved through the efforts of the research group in Fort Saskatchewan, and from time to time new patents are being taken out to cover the improvements.

COMMISSIONER GAINER: With respect to the refining of any metal, Mr. Pearce, or just certain ones?

MR. PEARCE: Mr. Gainer, with respect to any metal. We have not worked on all metals, but when anything that we have comes across an application to metals we certainly protect that in the same way.

I told you the other day that we were using nickel and cobalt, and that we could produce copper if the supply of copper concentrates, either our own



or somebody else's, rose to a sufficient value to make this economic.

We now come to this question of zinc.

Professor Forward of the University of British Columbia, acting as our consultant, has discovered a new method for the treatment of zinc concentrates. In order to explain this, Mr. Chairman, I would like to take a minute or two to describe the existing methods of treating zinc, and there are two of them. They both start the same way; they start by taking zinc concentrate, which is a sulphide mineral, zinc sulphide, and roasting this in furnaces where you burn off the sulphur. It appears in the stack gasses as a form of sulphur dioxide, and you are left with a calcine of zinc oxide.

THE CHAIRMAN: What is a calcine?

MR. PEARCE: A roasted product, a burned product. It is usually a sulphide mineral which has been converted into an oxide by the process of roasting. If I may follow the calcine for a minute, here it is that the two processes differ. In what is commonly known as a thermal process, this calcine is mixed with coal or coke or charcoal or some other carbonaceous-reducing material. It is charged to retorts; the retorts are heated. The carbon in the reducing material combines with oxygen that is attached to the zinc and the calcine and forms carbon monoxide carbondioxide. The zinc metal is left behind, and the retorting is conducted at such a high temperature



that this zinc is distilled off as a vapour and then recovered as a metallic zinc. This was the original zinc process. It requires fairly large amounts of fuel to heat the furnaces, particularly the retorting furnaces, it requires a high grade reducing agent. When you have a sufficiently large operation, low-cost fuels and low-cost reducing agents, it can be a very efficient method of refining zinc. It does not make the highest grade product; it makes a good ordinary zinc. By re-distilling the quality can be improved, but it never reaches an extremely high quality.

It is here that the second process comes in to its own. This is the process which is currently known as the electrolytic refining method. It starts the same way: you roast the concentrate to form calcine, zinc oxide. This calcine is then leached.

THE CHAIRMAN: What do you mean by "leached"?

MR. PEARCE: Agitated in a water solution of sulphuric acid. If I may use a very crude but the only possible analogy that I can think of - when you prepare a cup of coffee, you leach it, you leach the desirable material out of the ground coffee, the brown liquid is what you are looking for, and you are left with a residue, the coffee grounds, which are of no value, and you throw them away.

THE CHAIRMAN: Part of the acid combines with the zinc; is that it?

MR. PEARCE: Yes. In fact, all the acid



combines with the zinc. You put in just enough and you come up with a neutral solution of zinc sulphate, and this solution, after the proper purification, is then treated in electrolytic cells and zinc is deposited as pure metal and the acid is automatically regenerated. This process can be operated so as to produce an extremely high-quality base metal, and it is for its ability to produce this high quality metal that it has come in to wide use. This is the method which is used at Trail and at Flin Flon, the two existing zinc refineries in Canada; it is also the one that is used at Great Falls. So we have two competing methods. One a thermal or roasting or, rather, retorting method, and the other an electrolytic method. Both of them start with a roasting operation which results in the production of a stack gas.

THE CHAIRMAN: Before you go on, is the process of reduction something that combines with the oxygen?

MR. PEARCE: Yes, essentially. Now, there are important differences, Mr. Chairman, but for the purpose of this discussion I think we should limit ourselves to your definition.

THE CHAIRMAN: When you speak of a retort, is it just a receptacle in which the process is carried on?

MR. PEARCE: Yes, it is a receptacle. It is made of fireclay or some other material that will



stand sufficiently high pressure for the zinc to be distilled without breaking down. The two conventional processes produce sulphur dioxide as a stack gas. In the early days of the base metal industry, copper, lead, zinc - all of which, I may say, produce stack gasses containing sulphur dioxide in a varying degree - in the early days of the industry these stack gasses were merely pushed up the stack into the atmosphere. They are generally harmful to vegetation. In many of the early smelter towns in Canada and the United States all the vegetation was killed. This is still observable today in many of these towns, despite the fact that the discharge of stack gas into the atmosphere is in most cases today prohibited. It has taken tens of years in many of these towns to recover from the effect of the discharge of these stack gasses. So if you put up a conventional plant you are faced with the problem of what you are going to do with these stack gasses. You can make a virtue out of a necessity. This has been done at Trail. You can put in a secondary chemical plant to make sulphuric acid out of your stack gasses, and then you can put in an industry which will use up the gas which you have produced and make something useful of it. In Trail they make now a thousand tons a day of sulphuric acid, which is a by-product of their production of lead and zinc, and you cannot throw a thousand tons of sulphuric acid a day away, so they bought phosphate mines in Montana



and they now have a very flourishing industry in Trail using this sulphuric acid to make fertilizer. Some of the eastern base metal refineries, where they have sulphur dioxide, produce sulphuric acid, and it is sold as a chemical or regular industry use in that area. But you are often faced with the prospect of putting up a refinery in an area where the sulphuric acid is of no particular value; you do not have ready access to phosphate rock, you do not have the markets to absorb this sulphuric acid; you cannot put it in the river, it kill all the fish; you cannot let it go into the atmosphere because it would destroy vegetation. What are you going to do with it? Here I believe we have a very useful and significant new solution, and that is this process which Professor Forward has developed in which, to put it briefly, zinc concentrate is reacted directly to weak sulphuric acid. This absorbs the zinc as the form of zinc sulphate and it reaches the sulphur in the form of elementary sulphur, that is really a solid. In this form the sulphur can be marketable over much wider ranges than can sulphuric acid, much simpler to ship, it is much less bulky to ship. It is value, for instance, to paper mills, whereas sulphuric acid is of no value to a paper mill. If you cannot sell it you can store it, with no great cost; it does not deteriorate in storage, it does not need to be covered.

The zinc recovered by the new Forward



process is zinc sulphate in a form which is suitable for electrolytic refining. We have made the same zinc sulphate which is made by the conventional method by leaching a calcine. This process we have was new. It was announced in April of this year. It is presently being further developed in our laboratories at Fort Saskatchewan on behalf of Noranda Mines Limited. This is published information. Noranda have a zinc deposit in eastern Canada for which they think this process might prove eminently satisfactory, and development work is going on at the present time to find out exactly how this process might be applied to their zinc concentrate.

I can say, Mr. Chairman, that work is going on right now on the development of a similar process for the treatment of lead minerals, and this process for lead is not yet fully defined and therefore I am sorry I can't tell you anymore about it right now. We are still working on it.



THE CHAIRMAN: Has the zinc process gone to the point where you are certain it is commercially feasible?

MR. PEARCE: Mr. Chairman, I read the testimony given by Mr. Riley, in which you asked him this question, and Mr. Riley said, if I may quote:

"There seems to be no doubt."

I would say the same thing, but I cannot stand here to-day and tell you absolutely an unqualified Yes. If I could there would be no need for Noranda to have this development work done in our laboratories. When you sit down and say "How are you going to do this?" and "What material for construction will you use there?" and "How big a compressor do you need there?" -- there are certain questions as yet unresolved, and it is these details of the commercial application that we are endeavouring to define at this time.

COMMISSIONER GAINER: Just two points that I wondered about when we were discussing this process: the pressure work is not in your zinc process?

MR. PEARCE: If you take zinc concentrate and put it in sulphuric acid, a weak sulphuric acid, in an open tank nothing happens; it just sits there.

COMMISSIONER GAINER: That is what I would think.

MR. PEARCE: If you put it in an autoclave, and it is an agitated pressure vessel which we use



for leaching at above normal temperatures and pressures -- if we put the zinc concentrate in the sulphuric acid in an autoclave and heat it up and raise the pressure to about 100 pounds per square inch we then force this reaction of sulphuric acid and zinc sulphide to take place. The sulphuric acid attacks the sulphide. Taking temperature and pressure, this is what attacks it, but if you alleviate the pressure and temperature it does not. That is the significant part of the new discovery.

COMMISSIONER GAINER: Presumably that would also be the case if you used much higher pressure and not the temperature, or is it ---

MR. PEARCE: It is simply a matter of economics.

COMMISSIONER GAINER: But they are essentially substitutes, as is usually the case, pressure and temperature?

MR. PEARCE: Not entirely, because you have to have a significant oxygen pressure to get the oxidization to take place, and if you use temperature without the oxygen pressure you do not get the effect you are seeking. The two must be applied together.

THE CHAIRMAN: Suppose you were to put some lead-zinc concentrates through this process of Dr. Forward's, could you take the zinc out by that process and end up with a lead concentrate that could



be taken on to another smelter where it could be handled in the conventional method of handling lead?

MR. PEARCE: We are working right now on the treatment such as you describe, with a further refinement. To extract the zinc, yes, but also to leave the lead in such a form that a subsequent treatment right there on the spot would also extract the lead.

THE CHAIRMAN: That is what you hope to do?

MR. PEARCE: That is what we are working on now.

THE CHAIRMAN: But as matters stand now you have no doubt that the method that Dr. Forward has set out will be satisfactory for zinc?

MR. PEARCE: That is right.

THE CHAIRMAN: Now, that leaves the lead untreated?

MR. PEARCE: Well, just one minute. Maybe I should ask you to clarify this. You talk about lead-zinc concentrate and I think of a combined concentrate, a jugful of material which contains 15 per cent or 20 per cent lead and 20 per cent or 30 per cent zinc, and which cannot be further separated by further methods from such a concentration. In Canada today they are not being treated because they are too difficult.

THE CHAIRMAN: Is the lead-zinc concentrate that comes from Trail a difficult thing to be separated?



MR. PEARCE: Yes. The lead concentrate from Trail?

THE CHAIRMAN: Not from Trail; I mean from Pine Point.

MR. PEARCE: Now I have to be careful here because I do not have direct personal knowledge, but I believe the lead concentrate which would come from Pine Point contains predominantly lead sulphide and very little zinc at all, and the zinc concentrate contains predominantly zinc sulphide and very little lead at all.

THE CHAIRMAN: Are they easy to separate?

MR. PEARCE: Yes. This is supposed to be one of the features of the Pine Point deposit, the separation of the ore is very simple.

THE CHAIRMAN: So when they are shipped out of Pine Point ---

MR. PEARCE: They go in separate boxcars. The thing we work on is just mixed concentrates that you cannot separate and would have very little value for the reason that lead smelters do not like to have zinc in their charge and conventional zinc plants do not like to have lead in their charge. If we can come up with an economic method of treating these we will have made a significant step forward.

THE CHAIRMAN: I think perhaps we will adjourn for a few minutes.

---Short recess.



While we are not doing any work on the development of a pressure leaching process for such other metals as the ones you mentioned the other day - I think they were tin and tungsten and bismuth - it seems probable, in discussions with my colleagues over the weekend, that these metals could well be treated by similar processes if the necessity arose.

THE CHAIRMAN: You hadn't mentioned copper.

MR. PEARCE: Oh, I am sorry; I thought we had mentioned copper the other day. Copper - we have developed a method; we could put this into production at any time.

THE CHAIRMAN: By a similar method to this?

MR. PEARCE: Yes, that is right, pressure leaching. It is simply a matter of economics. So if we can list them, the possibles, if I may use the term, would be tungsten, bismuth, molybdenum, and tin.

THE CHAIRMAN: Copper is one concerning which you can now say you have no doubt.

MR. PEARCE: That is right.

THE CHAIRMAN: Nickel you are already working on.

MR. PEARCE: Yes.

THE CHAIRMAN: And zinc is one concerning which you have no doubt.

MR. PEARCE: Yes.

THE CHAIRMAN: And lead is one concerning which you have hopes?



MR. PEARCE: Yes; and we can add one - cobalt. We are using it, National Lead are using it, and Freeport will be using it in a matter of two or three months.

In this connection, Mr. Chairman, I have brought along some literature which may assist you. Mr. Gainer the other day asked if we would bring him the paper on copper production. I have three copies. The paper is entitled "Sherritt-Gordon Lynn Lake. Notes on Discovery and Financing". This is a little out of the field of metallurgy, but since we have been talking about the possible development of new mines in the Northwest Territories, we thought you might be interested in what was happening in a new development. These are by our President, Mr. Brown.

THE CHAIRMAN: Can you give us the highlights of what he has to say, or is that something you think we should read from start to finish?

MR. PEARCE: Well, it runs to four pages and, I am sorry, I don't feel competent to give you the highlights. I would like to make them available to you, and then maybe your Secretary could read them, or, if you don't want them, then I shall certainly not feel offended.

THE CHAIRMAN: Oh, indeed; we would very much like to have them.

Mr. Feehan, would you make sure that Mr. Bishop has a copy?



MR. FEEHAN: Yes.

THE CHAIRMAN: And I don't know whether you should send one to Mr. Southworth.

MR. FEEHAN: I will do that, sir.

THE CHAIRMAN: Mr. Baldwin will be here Wednesday morning and I would like him to see a copy of 1, too.

MR. FEEHAN: Yes, sir.

MR. PEARCE: There are three copies also here of a description of our refinery at Fort Saskatchewan. It is headed "Refining at Fort Saskatchewan", and this was presented at the annual meeting of the Canadian Institute of Mining and Metallurgy at Montreal, April 15th, 1959, and this is a description of the work we have done at Fort Saskatchewan on copper production.

THE CHAIRMAN: In that case you use hydrogen for the reduction method.

MR. PEARCE: Mr. Chairman, this was the reason I was a little hesitant about it. You were entirely correct in many instances. In our own particular refinery at Fort Saskatchewan this was the reason I was a little hesitant about it. You were entirely correct in many instances. In our own particular refinery at Fort Saskatchewan, and maybe I should say in the processes we apply to nickel, cobalt and copper, we use hydrogen as a reductant rather than carbon. This is not necessarily univer-



sal with pressure leaching. For lead we would probably not use hydrogen; for zinc we would probably not use hydrogen. Once you have it in the water solution you have a number of methods available. One is hydrogen reduction, but it is not inclusive.

Also three copies of the paper which Professor Forward gave in Pittsburgh in April this year, a process for leaching zinc concentrates with sulphuric acid and oxygen under pressure, and this is a copy of the new process.

THE CHAIRMAN: Which you have described to us in broad outline.

MR. PEARCE: Yes.

In talking before you on Friday, I mentioned that it was our objective not only to refine pure metals in Alberta, but further to process the metals into fabricated forms which should be useful to industry and which could be sold at enhanced prices. This, in our opinion, would not only benefit us but would benefit the rest of Alberta.

We have three copies of a paper entitled "Roll Compacting Produces Pure Nickel". It is a description of a process to reduce nickelstrip and could be applied at any time at Fort Saskatchewan if the markets were attractive to it. This again is not proven, sir; it has been brought to a point where it is justified at the present time, and we are now looking into the economics to see whether we can put it into production at Fort Saskatchewan. But this is



the type of work that we are doing, and it might be applicable to other metals.

THE CHAIRMAN: These are all the articles you are submitting?

MR. PEARCE: Yes, sir.

THE CHAIRMAN: Are they marked as exhibits?

THE SECRETARY: Yes.

MR. PEARCE: The other day, Mr. Chairman, I was asked to give some comments on the advisability or otherwise of exporting mineral concentrates out of Canada and comparing this, or maybe I chose to compare this, with refining them, treating them locally. I have some figures at my disposal today which I think reinforces the statements which I made on Friday. These are actual figures; they apply to our own operation for Saskatchewan. I may point out here that our mine is at Lynn Lake in Northern Manitoba and that, as you may read in the paper by Mr. Brown, in the early days we were unable to find any custom smelter in North America to which we could ship our concentrates for refining. We were then faced with two possibilities. One was to export them to Europe, the other one was to develop a method for refining them in Canada. Fortunately for me, certainly, and for a great many other people, the President decided to investigate methods for refining them here. These methods are successful, but here are some thoughts as to what the effect would have been if those concentrates had been



exported to Europe:

575 people at Fort Saskatchewan would not be working. This is a payroll of about \$3 million a year.

Before Sherritt-Gordon came to the town of Fort Saskatchewan the population was about 1,000. It is today 3,500.

We talked the other day about secondary industries. At Fort Saskatchewan today there is a hundred-ton-per-day sulphuric acid plant operated by Inland Chemicals Limited. This is adjacent to our refinery. It is not associated with us, but it exists there because we are one of its major customers, and it produces acid for many other people.

It is perhaps pertinent to the present discussions to note that acid from that plant is shipped north to the uranium mines at Lake Athabasca and, I believe, as far north as Gray Lake.

THE CHAIRMAN: And the payroll of that plant is in addition to the payroll you have already referred to of your own?

MR. PEARCE: That is right, sir.

You mentioned the other day, sir, this matter of freight rates, and I now come to some details that we have collected over the weekend on freight which may be of some interest to you. I should like to preface my remarks on freight by giving you this figure, that the Sherritt-Gordon opera-



tion in 1958 spent four and three quarter million dollars on freight alone. This is the largest individual item of our operating costs; it amounts to 28 per cent of the cost of producing nickel.

I have here some individual - -

THE CHAIRMAN: It is the largest individual item in your operating costs, which is 28 per cent of the cost of producing nickel.

MR. PEARCE: That is right.

COMMISSIONER GAINER: Is this inclusive of freight charges of your final product moving?

MR. PEARCE: No, this is total freight, concentrate to Fort Saskatchewan, custom concentrate to Fort Saskatchewan, and product shipped to the destination. But it is the amount of freight business which we have by having a refinery at Fort Saskatchewan.

THE CHAIRMAN: It is the freight bill you pay.

MR. PEARCE: Yes.

THE CHAIRMAN: Do you pay the freight on the finished product that you sell to somebody else?

MR. PEARCE: In effect, we do.

THE CHAIRMAN: Is that included in the four and three quarter millions?

MR. PEARCE: Yes, it is.

THE CHAIRMAN: You are referring now really to the amount of freight business which your



plant produces and not necessarily to getting the concentrates from the mine to the plant.

MR. PEARCE: That is correct; it is the total amount of freight business which we generate. I believe we are one of the largest single customers of the Canadian National Railway.

I have here, sir, some individual freight rates which may be of some interest to you.

On nickel concentrate from Lynn Lake to Fort Saskatchewan the rate varies from \$12.14 per ton of concentrate to \$14.43, depending on the valuation of the concentrate, which in turn depends on the amount of nickel in it. Our current valuation - we are paying the low rate of \$12.14. From Hope, British Columbia

--

THE CHAIRMAN: What is the distance from Lynn Lake to Fort Saskatchewan?

MR. PEARCE: 900 miles. From Hope, British Columbia - this is the Giant Nickel Mine - to Fort Saskatchewan, \$13.75 per ton.

THE CHAIRMAN: What distance is there from Hope to Fort Saskatchewan?

MR. PEARCE: I am sorry, sir, I can't quote you that figure.

MR. GORDON: It will be roughly about 710 miles.

MR. PEARCE: From the Port of Churchill, Manitoba --



THE CHAIRMAN: Just one moment. The distance from Lynn Lake to Fort Saskatchewan is 900 miles, and from Hope to Fort Saskatchewan is a shorter distance but the rate is a little higher.

MR. PEARCE: I believe this is due to the rate through the Rockies. Perhaps Mr. Gordon can say.

MR. GORDON: I don't think it is that. I think it is just a simple matter of volume movement. The movement from Fort Saskatchewan is probably a considerably larger volume, and being a larger volume they have cheaper operating costs. In order to get the large volume of traffic the railways have quoted the rates they have. I don't know the value of the Hope ores, but most of your ores and concentrate are shipped on what is called an ad valorem basis, and they do vary.

MR. PEARCE: From Churchill to Fort Saskatchewan - this is the North Rankin Mine - the rate is \$14.58 a ton.

THE CHAIRMAN: How far is that?

MR. GORDON: That one has got me beat for the moment, but I would say it is something over a thousand miles. I am not too sure.

THE CHAIRMAN: Could you find out for us, Mr. Gordon?

MR. GORDON: Yes.

MR. PEARCE: Copper concentrate from our mine at Lynn Lake to Noranda, in Quebec - this is a



copper concentrate containing about 30 per cent copper, and I am sorry, sir, I don't know the distance - it is from \$17.29 up to \$20.61, again depending on the valuation.

THE CHAIRMAN: Mr. Gordon, could you find out for us the distance between those two places?

MR. GORDON: Yes, I think I could do that, too.

MR. PEARCE: Copper sulphide from Fort Saskatchewan to Noranda - -

THE CHAIRMAN: You say copper sulphide. Is that something like concentrates?

MR. PEARCE: It is like concentrates.

THE CHAIRMAN: Is it as easy to handle on the railway?

MR. PEARCE: Yes, it is as easy to handle, but it contains a significantly higher proportion of copper. It is differentiated from copper concentrates. The copper sulphide, Fort Saskatchewan to Noranda, is from \$20.93 to \$24.15 per ton, again depending on the valuation.

THE CHAIRMAN: Do you know the distance there?

MR. GORDON: You have already asked me to get that in a previous one, sir, and I said I would get it for you.

MR. PEARCE: And the last one from Fort Saskatchewan to Tacoma, Washington - we have shipped some copper sulphide to the American Smelting and Re-



fining Company at Tacoma - \$21.32.

THE CHAIRMAN: From Churchill to Fort Saskatchewan I suppose is the rail rate and the water rate is something in addition to it.

MR. PEARCE: Yes. I am sorry, I don't have anything on the water rate.

We discussed the other day, Mr. Chairman, charges for smelting at existing refineries.



The rate which we pay for smelting copper concentrate to pure metal is very close to 6 cents per pound of copper in the concentrate. This applies to both Noranda and Tacoma. There are certain differences in the rates but they are quite small, and, therefore, we have said close to 6 cents per pound. This is the charge at the smelter and is exclusive of freight from our plant to the smelters. I can give you a rate which we have quoted for the refining of custom nickel concentrate at our refinery at Fort Saskatchewan. It becomes a little complicated, but to quote for nickel concentrate containing approximately 12 per cent nickel and 3 per cent copper, we would pay for the contained nickel delivered at Fort Saskatchewan less a deduction of 28 pounds of nickel per ton of concentrate, 43-8/10th cents per pound of nickel. This price is subject to fluctuations in the rate of exchange of the United States dollar, to escalation based on our rate for labour at the refinery and any increase in the freight rate on refined nickel to market.

We also pay for 90 per cent of the contained copper at the average price received by us for copper during the month preceding payment less 10 cents per pound. This becomes a little complicated, as you will see, but in effect it indicates that the cost of refining nickel from a custom concentrate, including a reasonable profit figure for ourselves,



is in the neighbourhood of 25 cents per pound.

I would like to note here, Mr. Chairman, that this is for concentrate of a type which is suitable for treatment in our refinery and would contain no deleterious elements. I put this into the record simply because we do not want it assumed that we will pay this price for any type of nickel concentrate.

THE CHAIRMAN: You mentioned the price that you pay for your refining is close to 6 cents a pound for copper. I take it in that case you pay a refinery or you pay a plant for treating your copper and then you own the commodity when it has been treated?

MR. PEARCE: That is right.

THE CHAIRMAN: But in the rate that you have referred to it is a case of your company buying the concentrate?

MR. PEARCE: That is correct.

THE CHAIRMAN: And of course you own the finished product?

MR. PEARCE: That is right.

THE CHAIRMAN: There are two methods of dealing with the metal. Is the metal dealt with more in one way than it is in the other?

MR. PEARCE: I believe in the case of copper it is usually for the shipper to pay a refinement charge and to retain ownership of the metal. He may then arrange a subsequent marketing arrangement with the company which smelted it, or with somebody else.



Nickel is a little different, and here we come to something which is individual to Sherritt-Gordon. We are producing nickel in a form which is new to the industry. We produce nickel as a pure metallic powder and we sell it as such, or we compress this powder into what we call briquets, which are small pillow-shaped solids about an inch and a half long and an inch wide and an inch thick. This is for the convenience of the steel industry, which is the largest user and which prefers nickel in a small solid rather than powder.

Now we get into this situation, if I may be hypothetical for a moment: supposing we do customer refining for somebody and charge them only a toll, and at the end we return their nickel to them in the form of briquets. It is possible for them to market this nickel in such a way as to be damaging to the nickel industry as a whole. This consumer then gets this nickel. He may have paid, for instance, a black market price for it and this is Sherritt-Gordon nickel. It does not matter whom he bought it from, it is our briquets. They say, "I had to pay a fantastic price for it." That is detrimental to our name, so as far as possible we prefer to retain control over this metal. We value our name very highly and we believe this to be essential to our welfare and that is the reason I would prefer to purchase concentrates rather than



to refine it on a toll.

Over the week end I had the opportunity of reading the statements made by Mr. Riley, in volume No. 7, and particularly the ones concerning the new zinc process developed by Dr. Forward. On page 557, in answer to a direct question from you, Mr. Riley stated that the new zinc process was a thermal method. I would like to make a comment or two on this particular point.

Using the conventional terminology of "thermal" about which I talked a few minutes ago, our new process is not a thermal method. This is a combination of pressure hydro metallurgy with electrolytic refining.

THE CHAIRMAN: Your process, however, involves the first stage which is common to all, and that is roasting?

MR. PEARCE: No, it does not. That is the significant part about it. We directly pressure leech concentrate without the roasting.

THE CHAIRMAN: With zinc?

MR. PEARCE: That is right.

THE CHAIRMAN: But with nickel?

MR. PEARCE: With nickel, with zinc, with copper, with cobalt, we get away from this roasting, we obviate the need for roasting.

COMMISSIONER GAINER: You start with the sulphate?



MR. PEARCE: We start with the sulphide and directly treat that.

THE CHAIRMAN: You refer to two conventional processes, each of which starts with roasting, and your process avoids it?

MR. PEARCE: That is right.

THE CHAIRMAN: And is it the roasting that takes up a lot of heat?

MR. PEARCE: No, most of the roasting involves heat. What requires heat in the conventional process is this distillation in retort of the zinc calcide with the reducing agent. I believe the confusion arose from a remark which was also made in Mr. Riley's testimony here in which he says that in Fort Saskatchewan they use natural gas. This is perfectly correct, but we do not use natural gas solely for the generation of heat. A large part of the natural gas at Fort Saskatchewan is used as a chemical raw material for the production of hydrogen and for the production of ammonia. We could use coal or fuel oil or the gas which we do use to heat our boilers and make steam, but we could not economically use these other sources of energy for the generation of hydrogen and ammonia. While we use a lot of natural gas at Fort Saskatchewan it is not correct to refer to our process as a thermal one. I would like to make this clear because there seems to be a little confusion in this



testimony that has been given by Dr. Riley.

THE CHAIRMAN: You have just read it and I have not read it for some time: what is the reason for Dr. Riley emphasizing that it was a thermal process?

MR. PEARCE: I am very hesitant to tell you what Mr. Riley's, or Dr. Riley's, reasons were. I infer from reading his testimony that he was suggesting that a similar refinery could be provided anywhere where there were ample supplies of fossil fuels, which is a term used to mean coal, oil or natural gas.

THE CHAIRMAN: It had nothing to do with the electricity which you thought might be available there; is that so?

MR. PEARCE: Well, maybe I could clear things up a little bit. I have some figures here that might be of interest to you. If I could refer for a moment to the British Columbia brief, Professor Forward on pages 19 and 20 of the Province of British Columbia's submission, quotes some figures for the cost of electrolytic energy for refining lead and zinc.

He says with electrical energy at $\frac{1}{2}$ cent per kilowatt hour the power required for electrolytic zinc is about 7/10th of a cent per pound of zinc and for electrolytic lead refining about 1/20th of a cent per pound of lead. I have some rough calculations for the cost of fossil fuels, assuming that you are using a strictly thermal process. These



indicate that for zinc instead of having a figure of 7/10ths of a cent per pound you would have a figure of about 4/10ths or 5/10ths of a cent per pound for fuel. I took coal at about \$3 a ton, gas at about 15 cents per thousand cubic feet. This was simply for my own interest in that Professor Forward says in his next paragraph there, or in the same paragraph, that the cost of fuel for refining zinc would be considerably less than 7 cents per pound of zinc where low-cost gas and coal are available. Our figures tend to reinforce his conclusions.

One point concerning lead which I would like to bring out: he says that gas for electrolytic lead refining is 1/20th of a cent per pound of lead. This brings up again the point which we discussed on Friday that there is a difference between smelting and refining, and particularly for lead you must first smelt your concentrate to lead bullion and then do electrolytic refining. Our figures indicate a cost of approximately .2 cents as the fuel cost for smelting lead.

THE CHAIRMAN: Then you add the refining cost to that?

MR. PEARCE: Yes, and of course as Professor Forward says, the refining cost for lead is inconsequential, it is very low, 1/20th of a cent, and we are talking about 1/5th of a cent for the smelting operation.



THE CHAIRMAN: Mr. Pearce, your conclusions are these, are they? Rather than the figures quoted from Dr. Forward's letter on page 20 of the B.C. brief of 7/10ths of a cent, your process would bring it down to 4/10ths of a cent?

MR. PEARCE: I am sorry, sir, no. I have not made myself sufficiently clear. I cannot quote you a figure on our process for lead or zinc because we are not that far along with our development. I take the next sentence of Professor Forward's letter where he says it is most likely 7/10ths of a cent.

THE CHAIRMAN: Where is that?

MR. PEARCE: The last paragraph -- the last sentence of the second paragraph on page 20.



THE CHAIRMAN: Oh, yes - "... it is most likely that the cost of fuel for retorting zinc would be considerably less than 0.7 cents per pound of zinc where low-cost gas and coal are available".

MR. PEARCE: For our own information, we did some approximate calculations to see if that was so and what the figure was.

THE CHAIRMAN: And you agreed with it.

MR. PEARCE: Yes, sir, we agreed with it. We came up with a figure of about four tenths, four to five tenths of a cent. We agree with his conclusion. He said considerably less than seven. We agree with that opinion; we have four or five tenths.

THE CHAIRMAN: You are just expressing agreement with what Dr. Forward has said, are you?

MR. PEARCE: Well, sir, if I would read the third sentence of the next paragraph - "thus the availability of large quantities of electrical energy at, say, 5 mills per kilowatt-hour is by no means of paramount importance in selecting a location for a zinc or lead reduction plant," - and we agree entirely with that statement.

THE CHAIRMAN: The pyrometallurgical plants are the same as yours, are they?

MR. PEARCE: No, this is the smelting and retorting plants, and I guess you would call them - I don't know; I presume he means a pyrometallurgical zinc plant would be a roasting and followed by



retorting or an electrolytic refining.

THE CHAIRMAN: I take it that your conclusions are that you agree with what Professor Forward has said at page 20, and the effect of what he has said is that it is more important to have cheap fossil fuel than it is to have cheap electricity.

MR. PEARCE: That is right. And if I may also say so, we entirely agree with the last paragraph of his submission. I think I covered that the other day.

MR. BISHOP: Could I ask a question, Mr. Chairman, at this stage?

I, too, am a bit confused by all the technical terms, but in the second last paragraph, the last sentence is: "In fact, all things being considered, the pyrometallurgical plants would be preferred where low-cost fossil fuels are available". He is not referring to the new proposed method; he is speaking of a choice of one of the present methods, isn't he?

MR. PEARCE: That is right.

MR. BISHOP: And in the last paragraph where he refers to the most desirable location for carrying out these operations, can you give us any opinion of what he had in mind, what type of place? I mean, would this present location where you are, Fort Saskatchewan, or the City of Edmonton, satisfy the requirements set out in his last paragraph?

MR. PEARCE: Here again, Mr. Chairman,



I am reluctant to say what was in Professor Forward's mind, but I think I expressed this on Friday, that we believe that such an area where we now operate is excellent for a base metals refinery. That area seems to me to fit in with the conclusion drawn by Professor Forward.

Sir, I have come to the end of my notes and the information which I wanted to present to you this afternoon. If there are any questions we will do our best to answer them.

MR. BISHOP: Mr. Chairman, Mr. Grimble asked me to ask if the ores known to exist in the Indian Mountain area - he refers to one million tons. It is referred to in one of the exhibits, and we are having a little difficulty in tracking down the correct exhibit. We are wondering whether or not it would be possible to bring those concentrates into Fort Smith by truck and then down to Fort Saskatchewan by rail and treat them at Fort Saskatchewan.

THE CHAIRMAN: It would come to Fort Smith by water, wouldn't it, Mr. Bishop?

MR. BISHOP: Well, both, I presume, sir: by water during the summer months and possibly - it is one of the questions we have asked various people - but possibly by winter road to Fort Smith during the winter. If Mr. Grimble can find this exhibit, possibly I can be a little more specific in my question.



Could I ask Mr. Grimble to speak on this?

MR. GRIMBLE: There is a paper from Ottawa which outlined the deposit in Indian Mountain near Thompson Landing. It stated that it was proven to be a million tons of base metal, 10 per cent zinc and a very small amount of lead and some silver. It was high in zinc and low in lead, and there was silver in it, and I was curious to know whether this could be handled at Fort Saskatchewan, whether this wouldn't be attractive to this new process for zinc.

MR. PEARCE: Mr. Chairman, I am very hesitant to commit ourselves on something as undefined as this. Off-hand, a million tons sounds like too small an ore reserve, but we should like to know a great deal more about it, about the minerality of the ore, the purity. We are certainly interested in learning of the development of any new base metal deposit in the Northwest Territories, and we would be interested in discussing the possibility of refining those concentrates with the owners of the mines, with the object of having the refining done at Fort Saskatchewan.

COMMISSIONER THOMSON: Mr. Grimble, is that a Department of Mines figure for the tonnage and the grade?

MR. GRIMBLE: It is the Department of Mines. I read it out of this excerpt we took from the Report of the Department of Mines. The Report number and the percentages and tonnages were all given in the



exhibit which was filed.

COMMISSIONER THOMSON: You don't know what the tonnage was when they worked it at all.

MR. GRIMBLE: No. I only have that one publication to refer to.

COMMISSIONER GAINER: I hope this question won't be too indefinite, but, from the point of view of considering in future doing your own custom work on something besides nickel and the experience in marketing those metals, what could you tell us about the likely advantages of a location here, let's say, as opposed to either east or west? Take, for example, copper and nickel, possibly zinc and lead. Would you feel that you would have a good location here in terms of both smelting and marketing, or would you consider a possibility that part of the industry may very well evolve or move further west or east? I am thinking particularly of the West Coast.

MR. PEARCE: Mr. Chairman, I would think that we may take it as a general statement that where an existing refinery is in actual operation, there is the most desirable place to do further refining either of the same or similar metals. In other words, if we developed a nickel mine in the Northwest Territories or a cobalt mine, I am sure that Fort Saskatchewan would be the most desirable place, because, firstly, we are the only people in Canada accepting custom concentrates at the present time, and, secondly, the only two custom smelters are located in Ontario.



If you developed an extremely large deposit, and I mean a very large deposit, you might then consider building your own refinery, and you would have to consider where you would put it. This covers nickel and cobalt; I think it also applies to copper; whereas we are handling copper-bearing materials in Fort Saskatchewan, we have a process, and, given sufficient tonnage, we could make it economic to treat copper at Fort Saskatchewan.

Now, as to lead and zinc, I don't think you can generalize. I assume that the concentrates from Pine Point would go to Trail; I would expect them to. They have sufficient existing refineries for lead and zinc in Trail. The economics of freight may change in the future to make it more advantageous for Consolidated to refine those metals in the north; I don't know.

COMMISSIONER GAINER: To put it one step further in so far as copper is concerned, I take it you might be interested or your company would be interested in going into a refining operation here if the ore bodies became available. Would that be the case whether it happens to be your company that did the exploration?

MR. PEARCE: Yes, sir, I believe that is the case.

COMMISSIONER GAINER: In other words, you would very much like to think of yourselves as being very much interested in copper processing as well as nickel as ore bodies are made available?

MR. PEARCE: Yes.



COMMISSIONER GAINER: Is your company doing a fair amount of exploration of its own?

MR. PEARCE: We are doing a good deal of exploration work.

COMMISSIONER GAINER: So you are, in any event, distinctly interested in branching out in other processes, and certainly copper would be one of the most interesting to you. Would that be right?

MR. PEARCE: Yes, sir.

Mr. Chairman, we have got a little further into the technology of base metal processing than I had anticipated when I came here on Friday afternoon. I would like to say that it has been very interesting for me. I have enjoyed it, and I would like to make to you, sir, and to the members of your Commission a suggestion. We have been talking about pressure leaching and autoclaves and this and that. We would be very pleased to extend to you, to the members of the Commission, to the officials attached to the Commission, an invitation to come out to Fort Saskatchewan and visit our refinery. It is only 20 miles from Edmonton. We believe we could give you an interesting and most instructive visit in one half day of your time. We think that such a visit would bring home to you, far better than any description I can give, what we are trying to do, how we are doing it, the success that we have achieved and how we might extend it to new developments in the north, and if you can find the



time to visit us, we would be very pleased.

THE CHAIRMAN: It is very kind of you, Mr. Pearce. We can't say at the moment whether we are in a position to take advantage of the invitations you have so kindly given us, but certainly we will be in touch with you very shortly about it.

MR. PEARCE: Very good.

THE CHAIRMAN: Any more questions?

We have enjoyed it very much. It has been very interesting and helpful, and we thank you both very much for coming here.

Is there anything further now that has to be dealt with this afternoon. It is twenty-five minutes to five. May this be a good time to adjourn until tomorrow morning?

MR. BISHOP: I think it would, Mr. Chairman. I don't think there is anything further in this particular connection. We would like to thank Mr. Pearce very much, too, for taking all this time.

THE CHAIRMAN: Tomorrow we will perhaps get back to your brief, Mr. Bishop.

MR. BISHOP: It will be a pleasure, sir.

THE CHAIRMAN: There appears now to be a fairly good prospect of finishing tomorrow, is there?

MR. BISHOP: I would think so, Mr. Chairman, because most of what we have to say in the remaining pages has been covered in detail and it is mostly a matter of interpretation.



THE CHAIRMAN: Mr. Baldwin was in touch with me during the afternoon, and he wants to be here and would like to go on with some rebuttal material during Wednesday, because he can't be here Thursday and Friday, so we will set aside that morning for him, and then we will consider some of the other witnesses we want to ask to come down.

So we will adjourn now until 10 o'clock tomorrow morning.

--- Adjourned.

